
**Relationship between symptoms of mild head injury, psychosocial
ability, psychological morbidity and coping style**

Emma–Rose Tessler

**Doctorate in Clinical Psychology
University of Edinburgh
August 2007**

Contents

	Page Number
List of Tables	1
Acknowledgements	3
Declaration	4
Abstract	4
Foreword	5
 Chapter 1 ~ Introduction	 7
 Section 1 ~ Introduction to head injury	 8
1.1 Elucidating the term head injury	8
1.2 Prevalence of head injury	8
1.3 Aetiology of head injury	9
1.4 Measurable outcome	12
1.5 Course of recovery	14
 Section 2 ~ Current study	 16
1.2.1 The mild head injured population	16
1.2.2 Definition of mild head injury	16

Section 3 ~ Symptoms following injury	19
1.3.1 Immediate symptoms	19
1.3.2 Observable outcome following head injury	19
1.3.3 Neurologically mediated problems	19
1.3.4 Emotional reactions to injury	21
1.3.5 Personality characteristics	21
1.3.6 Residual deficits	21
 Section 4 ~ Predicting outcome	 24
1.4.1 Unpredictability of prediction	24
1.4.2 Outcome variability	24
 Section 5 ~ Interacting factors	 27
1.5.1 The process of coping	27
1.5.2 Coping styles	28
1.5.3 Coping and health related symptoms	31
1.5.4 Underpinning theories	32
1.5.5 Social support and health related symptoms	33
1.5.6 Characteristics of social support	34
 Section 6 ~ Management	 36
1.6.1 Interventions	36
1.6.2 Early intervention	37

Section 7 ~ Aims and hypothesis	39
1.7.1 Aims	39
1.7.2 Hypothesis	39
Chapter 2 ~ Methodology	40
2.1 Ethics	41
2.2 Participants	41
2.3 Procedure	42
2.4 Materials	43
2.5 Measures	43
2.5 ~ a) RPQ	43
2.5 ~ b) MSPSS	44
2.5 ~ c) HADS	45
2.5 ~ d) COPE	45
2.6 Resources	46
2.7 Power	46
2.8 Data management	47
2.9 Statistical analysis	47

Chapter 3 ~ Results	49
Section 1 ~ Descriptive analysis	49
3.1 Response rate	49
3.2 Demographics	49
3.3 Scale reliabilities	52
3.4 Correlations	56
 Chapter 4 ~ Discussion	 70
4.1 Main findings	71
4.2 General discussion	77
4.3 Theoretical discussion	79
4.4 Study limitations	81
4.5 Future studies/recommendations	82
4.6 Conclusions/implications of the study	84
 Reference	 86
 Appendices	
Appendix 1 ~ A & E Information leaflet	103
Appendix 2 ~ Ethics committee approval letter	105

Appendix 3 ~ Participant invitation	108
Appendix 4 ~ Participant welcome letter	110
Appendix 5 ~ Participant information	112
Appendix 5 ~ Participant consent	113
Appendix 6 ~ Questionnaire pack	114

List of Tables	Page Number
Table 1.1 <u>Glasgow coma scale scores and definitions of severity</u>	12
Table 1.2 <u>Duration of PTA and corresponding severity of injury.</u>	13
Table 1.3 <u>Categorisation of severity following head injury.</u>	15
Table 2.1 <u>Study criteria.</u>	42
Table 2.2 <u>Descriptive features of the HADS.</u>	45
Table 3.1 <u>Sample characteristics (N=32).</u>	50
Table 3.2 <u>Internal reliability analysis for scales.</u>	52
Table 3.3 <u>Scale total scores (N=32)</u>	53
Table 3.5 <u>Correlation coefficients between RPQ, MSPSS,</u> <u>HADS & COPE (N=32).</u>	57

Acknowledgements

First and foremost, I would like to take this opportunity to thank my academic and clinical supervisors Dr Emily Newman and Dr Louise Blackmore for their time, advice and support. I would like to thank Dr Noelle Murphy for permitting access to the A&E database and thank you Marion Nicolson for pulling the lists from the database. I would also like to thank my participants for whom this study would not have been possible.

Thank you to my friends for doing the things that friends do best, just being there, and special thanks to the 'girlies' - the giggles have been great!

I would also like to take this opportunity to thank my family for their support and encouragement. Specifically Mark and Jaimes, without you both I'd probably be doing something else ;-)

D. Clin. Psychol. Declaration of own work

Name: Emma-Rose Tessler

Assessed work: Thesis

Title of work: Relationship between symptoms of mild head injury, psychosocial ability, psychological morbidity and coping style

I confirm that all this work is my own except where indicated, and that I have:

- Composed and undertaken the work myself
- Clearly referenced/listed all sources as appropriate
- Referenced and put in inverted commas any quoted text of more than three words (from books, web, etc)
- Given the sources of all pictures, data etc. that are not my own
- Not made undue use of essay(s) of any other student(s) either past or present (or where used, this has been referenced appropriately)
- Not sought or used the help of any external professional agencies for the work (or where used, this has been referenced appropriately)
- Not submitted the work for any other degree or professional qualification except as specified
- Acknowledged in appropriate places any help that I have received from others (e.g. fellow students, technicians, statisticians, external sources)

I understand that any false claim for this work will be penalized in accordance with the University regulations

Signature

Date.....

Abstract

The mild head injured population accounts for 80 per cent of all head injuries and whilst research has identified no neurological abnormalities, this population still report to experience functional impairment. The current study set out to explore the biopsychosocial factors that could exacerbate the symptoms of mild head injury. In this respect, the study looks at the relationship between post concussion symptoms, social ability, psychological morbidity and coping style using the Rivermead Post-concussion symptoms Questionnaire, the Multidimensional Scale of Perceived Social Support, the Hospital Anxiety and Depression Scale and the COPE questionnaire. Questionnaires were sent out to 138 individuals at 6 months post injury to identify relationships between coping style, post concussion symptoms, social support and psychological morbidity. 32 respondents completed and returned the questionnaires. Post concussion symptoms were positively related to social support, depression and anxiety. Active coping was found to be negatively related to post concussion symptoms whereas emotion focused and avoidant coping were positively associated with post concussion symptoms. The results of the study suggest that in order to improve symptoms of mild head injury practitioners must address symptoms of depression and anxiety, in addition to promoting a more productive coping style.

Foreword

The treatment of head injuries and the risks from acute complications following these types of injury can be found in the writings of the ancient Egyptians and Greeks. Until the 19th century clinicians focused upon management of immediate and acute risk following head injury. As such this type of management was at the forefront of medical writings at this point in time. It has only been in the past 200 years that documentation outlining the possibility of late onset symptoms following a blow to the head has emerged. Hilton (1877) in his lectures on rest and pain provided an example of symptoms such as concentration problems and personality changes in a ‘man of substance’ following concussion resulting from a fall from his horse. Hilton (1877) prescribed a course of rest and recommended that the patient work within his limits of fatigue. More recent research has validated the early descriptions of Hilton (1877) and a group of symptoms that are common to a majority of people following mild head injury have been identified (Gronwall & Wrightson, 1974; Rimel, Giordani, Barth, Boll & Jane, 1981). Even when apparent complete recovery is detected in the brain using neuro-imaging techniques, lasting impairments in a number of psychosocial domains have been identified (Gronwall & Wrightson, 1975).

Ongoing symptoms are problematic to the head injured population as they are thought to impact upon psychosocial functioning (Pritagano, 1996). Psychosocial functioning is described as an ‘individual’s adjustment to the injury and resulting disability, and one’s ability to relate to others’. This definition also includes ‘a person’s coping style in relation to the injury or illness, social support utilization, and emotional status’

(Uomoto, 2000, pg97). Thus these individuals endure the consequences of the injury and the subsequent associated psychosocial difficulties. Current research has identified the benefits of early management of problems before an emotional and psychological 'snowball effect' becomes entrenched (Bennett & Raymond, 1997). The Scottish Intercollegiate Guidelines Network (SIGN; 2000) has outlined the need for early intervention following mild brain injury. Studies upon early management have focused upon providing information and coping strategies to individuals and their caregivers (Ponsford, Willmott & Rothwell, 2002). Conversely no study to date has identified if an individual's particular coping style acts to protect him/her against entrenchment of symptoms. Therefore there is as yet little evidence to suggest that a focus on coping management is effective for health outcomes following head injury.

Chapter 1 ~ Introduction

Section 1 ~ Introduction to head injury

1.1 Elucidating the term head injury

The term brain injury implies damage to the brain that is sudden in onset and has occurred after birth and the neonatal period (Scottish Needs Assessment Programme; SNAP, 1998). It is thus differentiated from birth injuries, congenital abnormalities and progressive or degenerative diseases affecting the central nervous system. Head injury is the general term used to describe any trauma to the head, and most specifically to the brain itself. Traumatic brain injury is defined by Rose and Johnston (1996) as,

‘an insult to the brain, not of a degenerative or congenital nature, but caused by an external force, that may produce a diminished or altered state of consciousness (pg1).’

This definition sets traumatic brain injury apart from other acquired head injuries to the brain such as hypoxic damage or post-viral infections.

1.2 Prevalence of head injury

Epidemiological research conducted in the United Kingdom (UK) suggests that head injuries account for approximately 250 - 300 hospital admissions per 100 000 population in a single year (Jennett & MacMillan, 1982). Head injuries are more common in the UK compared to The United States of America (USA) where there is an estimated incidence of head injuries of 200 per 100 000 (Kurtz & Kurland, 1993).

Interestingly, research in the USA suggests that 25 per cent of people with a head injury fail to seek medical attention (Sosin, Sniezek & Thurman, 1996). This finding may be explained by the private health care system that operates in the USA, in that they are not able to afford to seek medical assessment. However, a recent study (Setnik & Barzarian, 2006) identified a number of contrary characteristics within this population. These 'non attendees' were more likely to be older, injured in the home and thought to have suffered a mild head injury. Although this is not the intention of the current study, to date no data exist to identify the percentage of 'non attendees' within the UK.

1.3 Aetiology of head injury

A traumatic brain injury occurs when an external force, as described by Rose and Johnston (1996), impacts upon the head hard enough to cause the brain to move within the skull. There are a number of incidents that can result upon an external force impacting the head: road traffic accidents are amongst the most common and account for approximately 50 per cent of head injuries; domestic/industrial accidents are attributable to a further per cent; 15 per cent of head injuries are caused by sports and recreational accidents and assaults account for per cent (BBC news online, 2007). If the external force is sufficient these accidents will result in at least one blow to the head causing internal movement of the brain within the skull.

Head injury is most commonly not one injury but a series of injuries which can occur in the moments and days following the initial injury. The effects of head injury can be characterised by either coma, periods of altered consciousness (concussion) and/or periods of amnesias. These features can be brief, last for a couple of minutes or hours or extend to weeks or months following the initial accident. If sufficient, the injury will cause tissue damage that will impair physical, mental and emotional abilities (Levin, Williams, & Eisenberg 1992).

There are two types of injury following impact with an external force: closed head injury and open head injury. The closed injury is the most common type of head injury where the skull is not penetrated and damage to the brain tends to be more diffuse. An open or penetrating injury is less common in the civilian (i.e. non military) population accounting for fewer than 10 per cent of injuries (Lezak, 1995) and occurs when the skull is fractured or damaged. The penetrating injury tends to result in significant tissue damage that is most often focused around the area of penetration.

The external force to the head directly resulting from the accident will cause the primary damage to the brain. The point of impact from this initial blow to the head is called the coup and is the location of direct damage to the brain. The brain is then, often, accelerated in the opposite direction of the external force and this impact with the skull is known as the contra coup. The contra coup impact causes bruising, more commonly termed contusions, around the area of the brain that collides with the skull.

As the brain has accelerated within the skull it must also decelerate causing further bruising of this delicate organ. The rapid acceleration and deceleration movement pulls apart nerve fibres and causes further damage to the brain. Thus there may have been only one blow to the head yet it is likely a series of injuries to the brain will have resulted.

Secondary damage can arise from either intra-cranial or extra-cranial complications including a reduction of, or interruption to, the oxygen supply to the brain which is carried by the blood, changes in heart rate and raised intra cranial pressure (Rose & Johnston, 1996). These complications generally occur one or two hours following the primary injury (Rose & Johnston, 1996) and the resulting trauma may be more destructive than the initial insult, as even a short interruption in blood supply will cause brain cells to be starved from oxygen and die (Powell, 2005).

A third type of organ damage arises from bleeding, bruising, swelling, chemical changes and/or the development of blood clots in the brain (Powell, 2005). This type of injury typically occurs hours or days following the initial accident. If detected early enough, medical intervention can save the patient; however if unnoticed and/or not monitored these injuries may cause death.

1.4 Measurable Outcome

The Glasgow Coma Scale (GCS; Teasdale & Jennett, 1974) is the most widely used and accepted quantitative measure of the duration and depth of impaired consciousness following head injury. The GCS is quick and easy to administer and acclaims international acceptance and a high degree of inter-rater reliability (Teasdale & Jennett, 1974). The scale scores a number of responses including eyes opening, motor response and verbal response. The collective score of these responses range from 3 – 15 and provides a category of severity depending upon the individual's level of consciousness. The definitions and scores of severity are detailed in Table 1.1:

Table 1.1 Glasgow coma scale scores and definitions of severity.

GSC Score	Severity
3 - 5	Very severe
6 – 8	Severe
9 – 12	Moderate
13 – 15	Mild

(Jenette, Teasdale, Braakman, Minderhoud, Heiden & Kurtze, 1979)

The scale is easily administered, generally upon arrival at accident and emergency, and is a reliable measure (Jennette et al., 1979). The GCS has a place in the early classification of individuals; however it does have limitations (Marion & Carlier, 1994; Richardson, 1990). The GCS can misclassify those who are seen to deteriorate from secondary damage; the scale scores are not reflective of the percentage of classified cases seen at accident and emergency – where 1 per cent of admissions fall into the

severe range while the severe range accounts for six scale points and 10 per cent of admissions to A&E fall into the moderate range which accounts for four of the scale points. The majority of admissions to A&E (80 per cent) with a head injury score within the mild range yet the mild ranges accounts for only three scale points (Nell, Yates & Kruger, 2000). In addition, the mild category encapsulates a broad range of impairments as has been recognised by Jennett (1989).

Outcome following head injury is also dependent upon length of time in post-traumatic amnesia (PTA). This can be defined as the time between injury and return to full consciousness. The duration of PTA helps to inform the severity of the injury (Russell, 1932). The definitions and scores of severity are detailed below in Table 1.2:

Table 1.2 Duration of PTA and corresponding severity of injury.

Length of PTA	Severity of injury
< 1 hour	Mild
1 – 24 hours	Moderate
1 – 7 days	Severe
> 7 days	Very severe

PTA is measured by orientation in person, place, time and memory of recent events. It is most commonly used as a measure of severity, either prospectively or retrospectively.

Standardised tests (e.g. Galveston Orientation and Amnesia Test; Levin, O'Donnell & Grossman, 1979; and Westmead scale; Ponsford, Wilmott, Rothwell, Kelly & Nelms, 2004). are used prospectively to assess the individual's performance upon memory and orientation (Wilson, Herbert & Sheil, 2003). Retrospective assessments are usually carried out via an interview of the patient and his/her carer, identifying when the individual recalls waking up. Inconsistency in accounts can be easily detected. However it is difficult to identify how much is true memory for events and how much reflects family recollection.

1.5 Course of recovery

As previously discussed, the course of recovery depends upon a number of factors including level of consciousness, duration of PTA and existence of complications (resulting from second and third injuries). As a result of the interacting factors, the effects of head injury outcome following a head injury can be categorised into three severity levels, detailed in Table 1.3:

Table 1.3 Categorisation of severity following head injury.

Severe Head injury: A GCS 3- 8, most commonly with PTA duration greater than 1 day.

Individuals usually display varying degrees of cognitive, physical and behavioural disorders. Prolonged rehabilitation is required for these individuals aiming at independence (which may take a number of years) Return to work may not be possible.

Moderate head injury: A GCS of 9 to 11 and or PTA of 1 to 24 hours. These individuals also portray a varying picture of difficulties in the physical, cognitive and behavioural domains. Intensive rehabilitation could take up to 12 months and return to work may be achieved.

Mild head injury: A GCS following injury of 12 – 15, duration of PTA less than 1 hour. These individuals are thought to be able to return to normal activity within a few days following injury. They may experience dizziness, impaired concentration, fatigue, depression, anxiety, irritability and memory difficulties for at least 3 months following injury. Evidence exists to suggest that some of these individuals remain symptomatic beyond what was initially expected (Mateer & D'Arcy, 2000; Ponsford, Willmott & Rothwell, 2000). This large group of people often face years of impairment affecting health, education, occupation, and social and emotional functioning.

Section 2 ~ Current study

1.2.1 Mild head injured population

This population can be subject to both complicated and uncomplicated head injury. Complicated mild head injuries are those that have intra-cranial abnormalities on day-of-injury; these are usually evident through computed tomography (CT) scans. In contrast, uncomplicated mild head injuries are those that show no sign of abnormalities through CT scans. Complicated mild head injuries account for between 7 – 20 per cent of patients attending A &E (Iverson, Lovell, Smith & Franzen., 2000). A recent study by Iverson (2006) identified no significant difference between patients with complicated and uncomplicated mild head injuries during neuropsychological testing. Therefore the findings of Iverson (2006) fail to account for the discrepancy within recovery from symptoms in this population.

1.2.2 Mild head injury definition

The World Health Organisation (WHO) task force (Carroll, Cassidy, Holm, Kraus & Coronado, 2004) developed a general definition of mild head injury which encapsulates both complicated and uncomplicated head injuries.

‘Mild traumatic brain injury is an acute brain injury resulting from mechanical energy to the head from external physical forces. Operational criteria for clinical identification include: (i) one or more of the following: confusion or disorientation, loss of consciousness for 30 minutes or less, post traumatic

amnesia for less than 24 hours, and/or other transient neurological abnormalities such as focal signs, seizure, and intra cranial lesion not requiring surgery; Glasgow Coma Scale score of 13 – 15 after 30 min post – injury or later upon presentation for healthcare. These manifestations of mild traumatic brain injury must not be due to drugs, alcohol, medications, caused by other injuries or treatment for other injuries (e.g. systemic injuries, facial injuries or intubation), caused by other problems (e.g. psychological trauma, language barrier or coexisting medical conditions) or caused by penetrating craniocerebral injury (Carroll et al., 2004, pg114).'

Typically individuals diagnosed as suffering from a mild head injury are not admitted to hospital or subject to routine follow up. These individuals leave A&E with an information leaflet providing guidance on appropriate medication following mild head injury and advice regarding exacerbation of physical symptoms such as nausea and vomiting (See Appendix 1). As previously discussed, many symptoms are common in the early days after injury, but resolve in many cases by three months (Dikmen, McLean & Tempkin, 1986). Nevertheless, difficulties do persist for many, often resulting in significant difficulties across all areas of functioning (Gronwall, 1991).

Section 3 ~ Symptoms following injury

1.3.1 Immediate symptoms

Research has identified that those suffering from a mild to moderate injury commonly report a cluster of symptoms that include: headaches, dizziness, fatigue, irritability, reduced concentration, sleep disturbances, memory dysfunction, sensitivity to noise and/or light, blurred vision and depression (Alves et al., 1986; Bohnen, Twijnstra & Jolles, 1992; Dikmen, McLean & Armsden, 1989; Evans, 1992; Rutherford, 1989). This set of symptoms has been recognised by WHO (1978) and classified as Post-Concussion Syndrome (PCS). Studies have reported a reliability of description amongst this pattern of symptoms and have noted that the ‘presentation of the post – concussion syndrome cluster of symptoms across samples of patients with head injuries is remarkably consistent’ (Mittenburg et al., 1992; p201). Although most PCS are thought to resolve within 3 months after injury (Alves et al., 1986; Evans, 1992), prospective studies have identified a significant minority reporting symptoms at 12 months following injury (Alves et al., 1986; Rutherford, Merette & McDonald, 1979). In addition, PCS may hinder ability to return to work and psychosocial functioning (Dikmen, McLean & Tempkin, 1986; Dikmen et al., 1989; Wrightson & Gronwall, 1981).

1.3.2 Observable outcome following head injury

In general, the ability to return to work following a head injury is often viewed as the key to recovery and normalization (Price & Baumann, 1990). Within our society the ability to work is seen as being normal. To many, this highly sought after commodity brings with it both social and economic benefits. Thus losing the ability to work gives rise to both social and economic costs: Work can often help establish and maintain personal identity, self esteem, confidence and social role (Cicerone & Fraser, 2000). The injury and the resulting inability to work often interrupts these aspects that maintain the individual's purpose, sense of self and self worth (Cicerone & Fraser, 2000). As a consequence of the head injury and the effect of the inability to work, a number of psychological disturbances can occur. Prigatano (1996) suggests that these psychological disturbances can be classified into three main areas: Neurologically mediated organic problems, emotional reactions to injury and pre-personality characteristics.

1.3.3 Neurologically mediated organic problems

Neuropsychologically mediated problems are likely to arise as a direct consequence of organic damage (Prigatano, 1996). In essence an individual's behaviour will be informed by the severity of the injury and the resulting organic damage. Following injury, the brain often experiences changes in the functioning of nervous tissue. These changes interact with the acquired accompanying cognitive limitations resulting in misunderstandings or distortions in making sense of the environment. Together these organic changes can manifest themselves behaviourally as agitation. Prigatano (1996)

outlines a similar pattern of interacting neurological and cognitive components which exists in individuals experiencing difficulty controlling their temper. In these situations often minimal antecedents exist; however the cocktail of neurological and cognitive impairment exhibits itself as disinhibition and an inability to control emotional response. Behavioural abnormalities such as confusion, socially inappropriate behaviours and abnormal emotional reactions may be related to particular focal areas of injury, such as the frontal and temporal lobes. Damage to either one of these areas can result in personality changes outlined above. Pepping & Rouche (1990) identified a number of organically based personality changes including egocentricity, inability to display empathy, emotional liability, paranoia, catastrophic reactions, impulsivity, mood swings, paranoia and inappropriate social behaviour.

In addition, cognitive deficits such as heightened distractibility, reduced attention, poor concentration and sluggish processing speed are common and could exacerbate organically based behavioural difficulties (Prigatano, 1996). As a consequence, difficulties can arise during tasks that rely upon memory, following instructions and learning new information. Thomsen (1984) reported a persistence of memory difficulties in approximately 80 per cent of individuals at 30 months following injury. Furthermore, difficulties in executive functioning were reported, including noticeable difficulties in planning, organising, task initiation and task persistence.

1.3.4 Emotional reactions to injury

Emotional reactions to injury are, in contrast to neuropsychologically mediated problems, not dependent upon severity of injury. An individual's reaction seems to result from a sense of loss, similar to that of a grief response, in recognition of his/her reduced ability (Cicerone & Fraser 2000). Depression is the most commonly reported emotional reaction to the recognition of loss (Prigatano, 1996). Low mood is thought to increase as a result of increased cognitive ability and recognition of deficits. Depression is most commonly experienced when the individual is placed in situations that put more demands up on his/her abilities, such as when returning to work (Prigatano, 1996). Additional symptoms experienced and associated with depression can include fatigue, changes in appetite (poor or excessive eating), low self esteem, feelings of worthlessness, difficulties in concentration and decision making (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; DSM-IV and International Classification of Diseases; ICD-10). As a result of the awareness of deficits and the feelings associated with these, individuals may begin to avoid situations that highlight their deficits. An individual's emotional reactions to injury vary depending upon awareness, personal adjustment understanding and acceptance of others, including family, friends and work colleagues (Prigatano, 1996).

1.3.5 Personality characteristics

Changes to pre-injury personality characteristics are often reported in the literature. These changes are conveyed as a reduction or amplification of pre-morbid characteristics (McKinlay, 1981). Often the individual lacks awareness of these

changes that are quite noticeable to close relatives and friends. McKinlay (1981) identified that behavioural changes in personality were more frequently reported as a problematic area than difficulties in memory, language and dependence. Moreover, in a follow up study, Brooks et al. (1986) identified a 15 percent increase in the reporting of personality changes over a five year period.

1.3.6 Residual deficits

Thus far the effects of mild head injury can affect many areas of an individual's life. In the main, the residual deficits that result from head injury can be grouped into three areas; physical, cognitive and behavioural (Powell, 2003). Physical impairments include tiredness, headache, loss of sensation, epilepsy, incontinence and impairments of movement, co-ordination and balance. The cognitive difficulties that Powell (2003) describes include: difficulties with memory, attention and concentration, speed of information processing, planning and organising, problem solving and perception. Emotional and behavioural changes include agitation, anxiety, anger and irritability, disinhibition, emotional instability, self-centredness, inflexibility, poor motivation, depression and personality change.

Other investigators (Khan, Baguley & Cameron, 2003) corroborate the main areas of impairment identified by Powell (2003) and highlight lifestyle consequences as a further problem area. These include: Unemployment and financial hardship, inadequate academic achievement, inadequate recreational opportunities, difficulties in maintaining interpersonal relationships and marital breakdown, loss of pre-injury roles

and loss of independence. In addition, psychological status can be altered and adjustment to disability is frequently encountered by people with head injury (Khan, Baguley & Cameron, 2003). Furthermore people often report difficulties with socialization and following head injury. Powell (2003) describes brain injury as 'the fastest growing disability' with more people surviving their injuries than previously (pg29).

Section 4 predicting outcome

1.4.1 Unpredictability of prediction

Predicting outcome from mild to severe injury still proves to be an area of relative difficulty for those involved in the care and management of the patient. The traumatic brain injured group represents a relatively diverse collection of individuals who show great variability within the arena of recovery. For example if you take two individuals involved in separate but similar road traffic accidents traveling at 30 miles per hour receiving similar head injury to impact sites will show quite different recovery periods and quite distinct outcome patterns. Both may have had a GCS score between 13 -15 upon arrival at accident and emergency and classified as suffering from a mild head injury. However, one individual may be discharged from hospital a couple of hours following admission, recovering at home and suffering from mild symptoms common to a mild head injury including dizziness and headache. Whereas, the other individual may be admitted to the rehabilitation ward with more severe symptoms associated with mild head injury such as inhibition, aggression, agitation and memory difficulties.

1.4.2 Outcome variability

Evidence suggests that both post-injury and pre-injury variables can account for the diversity in outcome following injury (Alexandre, 1983; Johnston & Hall, 1994; Levin, Benton & Grossman, 1982; Martelli, Zasler & Braith, 1996; Mayer, Keating & Rapp, 1986). Research has demonstrated that post-injury variables can considerably impact outcome. As highlighted earlier, considerable diversity in patient outcome arises from

post-injury differences in pathophysiology and associated sequelae (Levin, Benton & Grossman, 1982). Organically mediated variables such as length of coma, duration of post-traumatic amnesia, the presence of seizures and type of brain injury have been well documented and are known to influence outcome from a traumatic brain injury (Alexandre, 1983; Johnston & Hall, 1994; Ruff et al., 1993; Zasler, 1997).

Equally, evidence exists to support the view that non organic variables such as pre-injury status are influential in terms of outcome and are thought to be particularly important when considering long-term outcome and adaptation following brain injury (Martelli, Zasler & Braith, 1996). To some extent, variability in outcome is considered a function of the individuals' pre-morbid characteristics. In some instances events leading to impact and impact site may be similar. However differences between individuals' coping styles, social roles, personalities and intellectual functioning may influence rate of recovery (Mayer, Keating & Rapp, 1986).

In addition, outcome, at least in the survivor's view, is subjective. What one patient and/or family members consider positive may be viewed as an insurmountable loss by another individual and his/her family. Subjective view is part of an individual's personality just as the way in which a person copes with a certain situation at a particular time. Personality and coping style are conceptualized as stable over time, influencing the approach to dealing with a stressful problem/situation. For example, one individual may cope with changes in memory by identifying the difficulties he

experiences and the appropriate help, and using external memory aids, such as taking notes and using a mobile phone to remind him of appointments. Another individual may decide that there is nothing that can be done and stay at home, becoming increasingly low in mood.

Thus far we have identified that symptoms following head injuries can be biological and or psychologically mediated and that recovery from brain injury could be viewed as a chronic condition. Chronic illness can be defined as being without prospect of relative recovery, as comparatively long in duration, and with patients expected to live within the limitations imposed by their condition (Karlein, Schreurs & De Ridder, 1997).

Section 5 ~ Interacting factors

1.5.1 The process of coping

Coping is the approach which is adopted in response to daily difficulties and or major life events (Lazarus, 1993). Much debate exists behind the factors that influence coping; some researchers believe that an individual's personality affects the way that they cope in a certain situation, while others postulate that situational factors are influential upon the coping style of an individual within a particular environment (Compas, Worsham & Sydney, 1997; Lazarus, 1993; Singer, 1984,). Research on coping, its influential factors and the methods employed to manage stressful situations has a long history (Lazarus & Folkman, 1980; Menninger, 1954; Parker & Ender, 1996; Shapiro, 1965; Villant, 1971). Early theories of coping tended to be process-orientated; for example, psychoanalytic theorists viewed coping as an unconscious defence mechanism (Freud, 1933), which ranged from healthy to pathological. The main difficulty with this theory of coping lies within its measurement, as this approach generates a one dimensional characteristic to coping. More recent theories of coping tend to be based upon a conceptual analysis of stress and coping (e.g. Lazarus, 1966). Lazarus (1990) has defined coping as

‘constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person (pg99).’

Lazarus & Folkman (1984) point out that coping should be viewed as a dynamic process that shifts in nature throughout the process of the stressful situation. Furthermore, Lazarus and Folkman (1984) postulate that there are three procedures involved when coping with stress:

Process 1 – The primary appraisal in which the initial process of perceiving a threat to oneself is activated.

Process 2 – The secondary appraisal in which the process of bringing to mind a potential response.

Process 3 - The process of executing the response, coping.

Lazarus and Folkman (1984) state that the coping procedure does not occur in a purely linear sequence but more in a cyclical manner. Thus if an inadequate coping response is not readily available or is less effective than expected, then the situation may be reappraised as more threatening and vice versa.

1.5.2 Coping Styles

Lazarus & Folkman, (1988) identified eight ways of coping with a stressful situation reflecting two basic styles of coping: problem-focused coping and emotion focused coping. Problem focused coping is the term used to describe a problem solving

approach in order to deal with or alter the source of the stress. Emotion focused coping describes a style of coping adopted when an individual tries to manage or reduce the emotional distress that is associated or triggered by a stressful situation. Conversely, most stressful situations tend to elicit both types of coping. However, when the individual feels that something constructive can be done then problem focused coping predominates. In contrast, if the individual feels that the stressor is something that they cannot do anything about and it is something that must be endured then an emotion focused coping style will prevail (Lazarus & Folkman, 1980). The theorists emphasized that an individual's coping style is dependent upon the situation and/or their levels of social support. These two coping styles are embedded within the Ways of Coping measure developed by Lazarus, & Folkman (1980, 1985) which assesses an individual's coping style when under stress. The measure consists of a series of questions which depict a coping thought or action that people sometimes engage in when under stress. Respondents are requested to indicate their response in a given stressful situation using a yes/no response or by giving a rating on a multipoint scale. This type of rating would indicate that there is a right and a wrong answer. Many researchers have however identified that the responses from the Ways of Coping measure produces a number of coping styles in addition to the two identified by Lazarus & Folkman (Aldwin & Revenson, 1987, Carver & Scheier, 1985; Parkes, 1984). In a bid to rectify the problem of measuring an individual's response to stress, Carver and Scheier (1989) developed a coping inventory (COPE) which incorporates 13 conceptually distinct scales. These scales are based upon functional and less functional properties of coping strategies and highlight three distinctive coping styles

based upon active/problem focused coping, emotion focused coping and avoidant coping.

Features of active coping

Active or problem focuses coping is the term used to describe the process of actively taking direct steps to try to tackle a stressor or to improve the effects of the stressor. Active coping strategies can be behavioral or psychological responses and are employed to change the nature of the stressor itself and/or how it is appraised. The process of active coping involves a number of procedures: initiation direct action, increasing one's efforts and attempting to execute a coping attempt response. In addition, Carver, Scheier, & Weintraub, (1989) propose that active coping also involves that ability to plan, the ability to prioritise the stressor by putting other projects aside and the ability to seek social support solely for the purpose of assistance or information. Carver et al., (1989) stress that the seeking of social support has two functions one which has been outlined here and the other which is deemed as a function emotion focused coping. The researchers do however recognise that despite the conceptual distinction between these functions, these elements of social support often co-occur (Aldwin & Ravenson, 1987).

Features of emotion focused coping

Seeking moral support, sympathy or empathy have been deemed to be 'emotion focused' elements of social support (Carver *et al.*, 1989). These features are often sought to reduce or manage the distress associated with the stressful situation. Emotion

focused coping is employed when the stressor is viewed as something that must be endured (Folkman & Lazarus, 1980).

Features of avoidant coping

Avoidant coping is the term used to describe a set of strategies that are employed to avoid a stressful event. Avoidant strategies direct people into activities (such as alcohol use) or mental states (such as withdrawal) that keep them from directly addressing stressful situations.

1.5.3 Coping and health related symptoms

Assessing the role of coping in the lives of those with neurological conditions is becoming increasingly common (MacCarthy & Brown, 1989; Rosenbaum & Palmon, 1984). This 'en vogue' approach to research acknowledges the multi factorial and often competing and interacting aspects of an individual's life. This method encompasses neurological, psychological, psycho social variables and their mutual interdependencies. In addition research has begun to analyse coping models in a variety of chronic disorders such as Parkinson's (MacCarthy & Brown, 1989) Rheumatoid arthritis (Zatura & Manne, 1992), diabetes (Frenzel et al., 1988), cancer (Helm et al., 1993), multiple sclerosis (Jean, Paul & Beatty, 1999) and epilepsy (Rosenbaum & Palmon, 1984). The findings of these studies highlight problem focused coping as one of the most adaptive coping patterns. This style of coping is correlated with increased mental health and well being (Snyder, 1993), improved psychosocial adaptation (Krakow, Buhler & Haltenhof, 1999; Krakow, Haltenhof &

Buhler 1999; Murray, 1993) and enhanced quality of life (Abbott, 2003). In contrast, emotion focused coping has been linked to greater incidence of depression in individuals (Jean, Paul & Beatty, 1999), while avoidant coping has been correlated with increased distress and poor adherence to therapy (Abbott, 2003). Despite this somewhat positive research in the domain of coping there is little evidence to support a particular coping style in the recurrence of biologically mediated symptoms (Pettigrew, Bell & Hunter, 2002). The research would suggest that coping styles are influential upon psychologically but not biologically mediated symptoms.

1.5.4 Underpinning theories

Biomedical models explain health primarily in terms of measurable biological outcomes. Kay (1992) proposes a pre-morbid vulnerability to neurological impairment. This theory suggests that differences in brain structure and neurotransmitter functioning may render the organ more vulnerable in the event of injury. However, we have identified, through previously discussed research, that symptoms resulting from a brain injury cannot solely be explained by a biomedical model. Bio-psychosocial models understand an individual's symptoms by incorporating both biological and psychological factors. The stress, coping and vulnerability model of brain injury is a multi factorial approach to explain symptoms. This approach proposes that injury results in insult to multiple domains including, neuro-physical, cognitive, emotional and social. As such, multi factorial impairment is thought to place demands upon coping capabilities and diminish other wise functional resources through loss of pre-morbid skills (Martelli, Braith & MacMillan, 1992). Discrepancies in outcome are

wide-spread following head injury. In order to account for these discrepancies a 'threshold model' (Satz, 1993) or 'brain reserve capacity' has been proposed in order to explain the differences in onset of clinical symptoms and expression of difficulties following injury. Satz (1993) further suggests that pre-morbid psychosocial factors and intellectual ability are indirectly accountable measures of this theory

1.5.5 Social support and health related symptoms

Social support has also been identified as influential with regards to symptom reduction. Favourable health effects resulting directly from social support have been documented for decades (For an overview see Schwarzer, Knoll & Riechmann, 2004). In a recent study with chronically ill individuals Sacco & Yanover (2004) identified that poor social support was positively correlated with depression and poor physical health. These findings emphasize the importance of interpersonal factors when considering the physical and mental health of individuals. In addition, the alleviation of psychological distress has been linked to social support (Ganster & Victor, 1988; Morris, 1986). The seeking of professional support by those in distress is may be directly influenced by lack of social support (Lindsay & Powell, 1994) However, following moderate to severe brain injury individuals are routinely followed up rather than personally seeking support. During a study that looked at brain injury individuals whom were undergoing routine rehabilitation researchers identified that social support alone could not predict depression in this population (Bay et al., 2002). However this study did not consider the fact that these individuals may be comparing themselves to their supporters. In order to gain a better understanding of the effects of directly

comparing the impaired with the unimpaired social support providers, one must consider certain aspects of social support that are detailed below.

1.5.6 Characteristics of Social support

Social support has been defined as ‘the resources provided to us through our interactions with other people’ (Sheridan & Radmacher, 1992; pg235). The resources that Sheridan and Radmacher (1992) highlight have been identified as ‘assistance and protection’ which arise as a consequence of a range of relationships most specifically from friends and family (Langford et al., 1997). Research in social support is hinged upon three interacting theoretically based foundations (Langford et al., 1997): social comparison theory, social exchange theory and social competence theory. Social comparison theory stems from the belief that an individual’s self concept develops through comparisons of others that one believes are similar (Festinger, 1954). Langford et al. (1997) postulate that social exchange is a key element in the experience of social support in that one must be subject to the giving and receiving of social support. In addition, social support is thought to be ineffective without social competence. The skill of social ability allows for the formation and maintenance of relationships which gives rise to social exchange and comparison. However the social competency of brain injured individuals is not the subject of this research. Yet it must be appreciated that in order to fully benefit from social support one must be adequately skilled in executing its interacting factors. McCauley et al., (2001) identified poor social support as one of the risk factors to increased PCS in individuals with a brain injury. Interestingly, Bay et al. (2002) did not identify a relationship between social support and depression. However this lack of correlation may have arisen through the

lack of an adequate comparison group. Perhaps a lack of social reciprocity or exchange may have existed within this group.

Section 6 ~ Management

1.6.1 Intervention

Mild head injured individuals are not routinely followed up. In recognition of the research highlighting the ongoing significant impairments endured by the mild head injured population (Grownwall, 1991; Mateer & D'Arcy, 2000; Ponsford, Willmott & Rothwell, 2000) the Medical Disability Society (1988) recommended that :-

“every patient attending hospital after a head injury should be registered and offered an outpatient follow up appointment.”

In an evaluation of the recommendations of the Medical Disability Society, Wade, Crawford, Wenden, King & Moss, (1997) carried out a large randomised control trial (RCT) to determine if a routine follow up service would be beneficial to patients following a head injury. 1156 consecutive patients were assigned to either the ‘treatment as usual’ group or the ‘early intervention’ group. Those in the early intervention group were approached at 7 – 10 days post-injury and offered information, advice, support and if required, intervention. At a six month follow-up the investigators identified that the specialist service had been beneficial to those who had suffered a moderate or severe injury but did not serve any benefit to those with a mild head injury.

In a follow up RCT Wade, King, Wenden, Crawford & Caldwell, (1998) confirmed that head injured patients benefit from routine intervention services. The trial used 314

consecutive patients randomly allocated into a control and a trial group. The control group received the standard hospital service while the trial group were provided a specialist service including information, support and advice. Upon reviewing the findings of the second RCT, Wade et al. recommended that specialist services be made available to those attending A&E or reporting to their general practitioner with 'appreciable' post- concussion symptoms within a few weeks of their injury rather than restricting the advice to only the moderately or severely impaired.

1.6.2 Early intervention

A number of studies have examined the impact of providing information regarding injury and potential effects of the injury (Alves, Macciocchi, & Barth, 1993; Grownwall, 1986; Relander, Tropp & Bjorksteinaf, 1972). Grownwall (1986) and Alves (1993) identified no significant change in symptoms by the provision of information. The studies by Relander et al., (1972) and Alves et al., (1993) were carried out with patients admitted to hospital rather than discharged from A&E, which makes the clear interpretation of the results difficult on account of the introduction of uncontrolled and/or confounding variables such as increased/additional symptoms from other injuries or changes in environment etc. A recent study (Ponsford et al., 2002) was carried out in order to closely examine the impact of the provision of written information upon the mild head injured population discharged from A&E. At one week following injury participants in the intervention group were seen and provided with an information booklet outlining common symptoms, course of recovery and suggested coping strategies. Ponsford et al., (2002) reported that the provision of

an information booklet was enough to reduce the reporting of symptoms at 3 months following injury. However the fact that the intervention group also received coping strategy advice introduces a confounding variable. It is therefore difficult to identify if the information book or the coping strategies discussion alone, or in combination, accounts for the results that Ponsford et al. report. Nevertheless an improvement in symptomatology has been identified in this population.

Section 7 ~ Aims and Hypotheses

1.7.1 Aims

The aim of the current study is to identify if a particular coping strategy gives rise to an increase or decrease in reported symptoms following mild head injury. The main rationale arose from the findings of the Ponsford et al. (2002) study that early intervention can improve symptom outcome in the mild head injured population. The study measured post concussion symptoms to identify if there was a relationship between these symptoms and coping style. In addition a number of other relationships were explored, including the potential relationships between post concussion symptoms, social support, depression and anxiety.

1.7.2 Hypotheses

1.7.2.1 It was predicted that post concussion symptoms would be negatively related to active coping and positively related to emotional and avoidance coping.

1.7.2.2 Social support was predicted to be negatively related to post concussion symptoms as symptoms of mild head injury may affect an individuals' ability to engage in social reciprocity.

1.7.2.3 A positive relationship with post concussion symptoms and symptoms of anxiety and depression was predicted.

Chapter 2 ~ Methodology

2.1 Ethics

In order to gain access to the relevant participant information, the proposed study was discussed with the accident and emergency consultant. Once her support was gained a study protocol and ethical application were submitted to the local National Health Service (NHS) ethical committee to ensure that the study adhered to the NHS ethical principles. In addition the study was conducted under the adherence of the British Psychological Society (BPS) ethical principles and codes of conduct pertinent to conducting research on human participants (BPS, 2006).

2.2 Participants

Upon discharge from Highland A&E departments' information pertaining to the patient and the reason for admittance is documented within an internal database. This database was still in its infancy when the study was conducted. Potential participants were 285 consecutive mild head injury diagnosis discharges selected from the data base between the months of July and September 2006. Potential participants were subject to a number of inclusion and exclusion criteria, detailed in Table 2.1:

Table 2.1 Study criteria.

Inclusion criterion:	Exclusion criterion
Diagnosis of mild head injury.	Learning disability
GCS between 13 – 15	Living out with the UK
Aged between 16 – 65	Under the age of 16
English speaking	Over the age of 65

Of the 285 individuals identified as discharged with a diagnosis of mild head injury, 138 individuals met the inclusion criteria for the study.

2.3 Procedure

Postal invitations were initially sent out to the 138 consecutive patients with a mild head injury six months after injury. Three days later postal questionnaire packs were sent out to the same group. Participants were requested to sign a letter of consent and complete the questionnaires. Upon completion participants were requested to return the consent forms and the questionnaires using the stamped addressed envelopes provided.

2.4 Materials

An invitation letter was used to request participation in the study (See Appendix 3). The questionnaire packs consisted of a welcome letter, information sheet, consent forms and a questionnaire pack requesting demographic details and four standardised measures; the Rivermead Post Concussion Symptoms Questionnaire (RPQ; King, Crawford, Wenden, Moss & Wade, 1994), Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, Farley, 1988), the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) and the COPE questionnaire (Carver, Scheier & Wintraub, 1989).

2.5 Measures

2.5.1. A) Rivermead Post Concussion Symptoms Questionnaire

The RPQ is a 16 item self administered scale developed to detect a range of post-concussion symptoms following head injury. The RPQ is a reliable, validated measure for use both 7 – 10 days after injury and 6 months following injury (King et al., 1994).

The questionnaire takes approximately 5 minutes to complete, each item is scored on a 5-point Likert-type scale that ranges from 0 – 4 (0 = not experienced, 4 = severe problem) yielding a score of 0 – 64.

2.5.2. B) Multidimensional Scale of Perceived Social Support

MSPSS is a 12 item self administered scale developed identify sources of perceived social support. The MSPSS was originally validated on the university student population (Zimet et al., 1988) and is now identified as a reliable and valid measure for a number of populations including older adults and psychiatric patients (Stanley, Beck & Zebb, 1998; Zimet et al., 1990). Stanley, Beck & Zebb, (1998) demonstrated that the MSPSS has good internal and test-retest reliability. Although the wording on the MSPSS is exceptionally positive the measure has been acknowledged to be free from social desirability bias (Dahlem, Zimet & Walker, 1991; Kazarian & McCabe, 1991). The MSPSS consists of three each addressing a different source of support: family, friends, and significant other.

The measure take approximately 5 minutes to complete, each item is scored on a 7-point Likert-type scale that ranges from 1 – 7 (1=very strongly disagree, to 7 = very strongly agree) yielding a score of 1 – 84.

2.5.3. c) Hospital Anxiety and Depression Scale

The HADS is a brief, 14 item self administered scale developed for detecting states of depression and anxiety. The HADS is a validated measure of severity of emotional disorder in a number of populations including somatic, psychiatric, primary care, general (Zigmond & Snaith, 1983). It has recently been validated within the brain injured population (Dawkins et al., 2006). The HADS is a popular measure of depression and anxiety among multi-national researchers (Bjelland et al., 2002).

The questionnaire takes approximately 10 minutes to complete, each item is scored 0 – 3, yielding a score 0 – 21. Cut off points and descriptive details are contained in table 2.2:

Table 2.2 Descriptive features of the HADS.

Total score	Description
0 – 7	Normal
8 – 10	Mild
11 – 14	Moderate
15 – 21	Severe

2.5.4. D) COPE (Carver, Scheier & Wintraub, 1989)

The COPE is a 60 item self administered scale developed to identify predominant coping styles in response to stressful situations either generally or on specific occasions. The COPE measure is based upon established coping mechanisms (Aldwin & Revenson, 1987; Carver & Scheier, 1985; Carver, Scheier & Weintraub, 1989; Parkes, 1984) and has been validated under a number of investigations and has acceptable internal consistency, test – retest reliability and construct validity (Carver et al., 1989). The measure is theoretically based and provides a broad measure of style of coping an individual uses, within active, emotion focused and avoidant strategies. The COPE identifies 15 conceptually distinct aspects of coping which are dissected into 5 sub-scales. Five scales measure different types of active coping (active coping, planning, suppression of competing activities, restraint coping and seeking

instrumental support), five scales measure aspects of emotion focused coping (seeking of emotional support, positive reinterpretation, acceptance, denial and turning to religion) three scales measuring aspects of dysfunctional or avoidant coping (focus on and venting of emotions, mental and behavioural disengagement) and two sub-scales measure the use of humour and alcohol and drug use as coping strategies.

The questionnaire takes approximately 15 minutes to complete, each item is scored on a 4-point Likert-type scale that ranges from 1 – 4 (1 = I don't usually do this at all, 2 = I usually do this a little bit, 3 = I usually do this a medium amount, 4 = I usually do this a lot) yielding a score 1 – 240.

2.6 Resources

The University of Edinburgh and the East of Scotland Training Course in Clinical Psychology funded the chief investigator's time, travel expenses and return postage. Highland health board department of psychological therapies funded the resources for photocopying, stationary and outgoing postage. The chief investigator funded the statistical licence.

2.7 Power

Effect size was calculated in accordance with Cohen (1992). It was calculated that a sample size of 80 participants would be required for a medium effect size using regression analysis to achieve a power of 0.8 and alpha at 0.05. To perform correlation

analysis it was calculated that 30 participants would be required for a medium effect size to achieve a power of 0.8 and alpha at 0.05.

2.8 Data management

Raw data was entered into separate databases' using the statistical package for the social sciences (SPSS) version 14 for windows.

2.9 Statistical Analysis

A Spearman's Rank Order (ρ) correlation analysis was undertaken as the data was not normally distributed. In addition partial correlations were carried out in order to identify the relationship between two variables while controlling for a third variable.

Chapter 3 ~ Results

Results – Descriptive analysis

3.1 Response rate

32 respondents returned completed questionnaires out of the 138 distributed. This reply quantity provides a response rate of 24 per cent. The response rate of the current study is in keeping with current research (Harrison & Cock, 2004) that uses a pre-warning letter inviting patients to respond to an impending postal questionnaire.

3.2 Demographics

The demographic information detailed in this section was derived from the questionnaires.

Participant age ranged from 16 to 63 years, with a mean age of 42.5 years ($SD=14.8$). There were fairly even numbers of males and females, with 18 males and 14 females respondents. Participants were asked to provide details of their marital status, current employment status and details of the head injury using response boxes. Table 3.1 displays the characteristics of the sample.

Table 3.1 Sample characteristics (N=32).

Marital Status	N	%
Single	12	37.5
Married/Cohabiting	12	37.5
Divorced/separated/ widowed	8	25.0
Employment Status		
In education	4	12.5
Employed	17	53.1
Unemployed - seeking work	5	15.6
Self employed	1	3.1
Retired/Other	5	15.6
Accident type		
Road traffic accident, including pedestrian	5	15.6
Cyclist	5	15.6
Accident at home	5	15.6
Accident at work	4	12.5
Assault	8	25.0
Other	5	15.6
Previous head injury		
Previous head injury	11	34.4
No previous head injury	21	65.6
Glasgow Coma Scale		
14	1	3.1
15	31	96.9

As is displayed in Table 3.1, 37.5 per cent of respondents were single, 37.5% were married or cohabiting while 25 per cent of the sample were divorced/single or widowed. 12.5 per cent of the respondents were currently in education and 53 per cent were in employment. 15.6 per cent of respondents were unemployed and seeking work,

3.1 per cent were self employed while 15.6 per cent were retired or pursuing another avenue.

Road traffic accidents (including pedestrians) accounted for 15.6 per cent of the sample while a further 15.6 per cent were cycling-related. 15.6 per cent respondents had endured accidents at home while 12.5 per cent suffered an accident at their work place. Assaults accounted for 25 per cent of the sample and 15.6 per cent experienced another type of injury. Previous head injuries accounted for 34.4 per cent of the sample whereas for 65.6 per cent of respondents this was their first head injury.

Information pertaining to GCS was obtained from the participants notes. 3.1 per cent of respondents had a GCS of 14. A GCS of 15 accounted for 96.9 per cent of the sample. Therefore all participants experienced a mild head injury, with the majority falling within the upper scale of mild.

A number of demographic details that were obtained from the A&E database were used to compare the responding sample to the representative sample of mild head injured individuals attending A&E. The representative age ranged from 16 to 65 years, with a mean age of 35.5 years (SD13.1) which is 7 years younger than the responding sample.. There were 76 males and 26 females, all had a GCS of 15.

3.3 Scale reliabilities

Table 3.2 Internal reliability analysis for scales.

Measure	Cronbach alpha coefficient
RPQ	.919
MSPSS - Significant other	.880
MSPSS – Family	.790
MSPSS - Friends	.851
HADS – Depression	.885
HADS – Anxiety	.886
COPE - Active coping	.726
COPE - Emotion coping	.885
COPE - Avoidant coping	.634

As indicated in Table 3.2 Cronbach alpha coefficient scores for the measures used in this study are above .7, showing satisfactory to good internal reliability (Pallant, 2004,.pg92). With the exception of the avoidant coping sub scale of the COPE that has a Cronbach alpha coefficient score of .634.

3.3 Scale reliabilities

Table 3.3 Internal reliability analysis for scales.

Measure	Cronbach alpha coefficient
RPQ	.919
MSPSS - Significant other	.880
MSPSS – Family	.790
MSPSS - Friends	.851
HADS – Depression	.885

Table 3.4 Scale total scores (N=32)

	Mean	Std. Deviation
RPQ Total	20.66	14.370
MSPSS Total	67.66	10.787
Support from significant other	23.25	5.035
Support from family	23.06	3.801
Support from friends	21.34	4.776
HADS total	16.19	9.88
Depression total	6.34	4.942
Anxiety total	9.84	5.742
	Mean	Std. Deviation
Active coping	44.66	11.485
Emotion focused	18.56	6.138
Avoidant coping	22.38	6.031

A descriptive account of the minimum/maximum scoring of the scale totals and sub-scale totals is provided along with the mean scores and standard deviations (S.D.).

RPQ

The RPQ ranged from 0 to 55. The mean RQP score was 20.66(S.D. = 14.37) which fell within the mild problem range of responding. The validity of the RPQ scale was tested on the data collected.

MSPSS

The MSPSS score ranged from 43 to 84. The mean MSPSS score was 67.66 (S.D. = 10.79) which indicates the average response as mildly agree. The support from significant other sub-scale ranged from 4 to 28. The support from significant other mean score was 23.25 (S.D. = 5.04). The support from family sub-scale ranged from 15 to 28. The significant other mean score was 23.06 (S.D. = 3.8). The support from friends sub-scale ranged from 8 to 28. The significant other mean score was 21.34 (S.D. = 4.78).

HADS

HADS scale ranged from 3 to 38. The mean HADS score was 16.19 (SD = 9.88, which fell within the range that would be suggestive of a presence of a mood disorder within the mild range. A mean score of 6.34 (SD = 4.94 was recorded within the depression

subscale which falls within the normal range. The subscale of anxiety ranged from 1 to 19. The mean anxiety score was 9.85 (SD = 5.74) which falls within the mild range.

COPE

The Active coping subscale of the cope ranged from 23 to 65. The mean score was 44.66 (S.D. = 11.49). The emotion focused sub-scale of the cope ranged from 9 to 31. The mean score was 18.56 (S.D. = 6.12). The active focused sub-scale ranged from 12 to 38. The mean score was 22.38 (S.D. = 6.03)

3.4 Correlations

Relationship between symptoms and social support

To test whether symptom reporting was significantly related to social support, Spearman's correlation coefficients were calculated between RPQ scores, total social support score and each of the three social support subscales. As the distribution of the data was not normally distributed, Spearman's Rank Order (rho) Correlation was used to calculate the strength between the continuous variables. Table 3.5 displays the rho (r_s) coefficients between the variables

Relationship between symptoms and social support

Table 3.5 shows that there was a significant negative correlation between RPQ and perceived social support as scored by the MSPSS was identified ($r_s = -.351$, $n = 32$, $p < .05$). The r value indicated that lower levels of social support were associated with higher symptom levels. However, Table 3.5 also shows that symptom reporting was not significantly associated with social support from friends ($r_s = -.291$, $n = 32$, $p > .05$), family ($r_s = -.163$, $n = 32$, $p > .05$) or significant others ($r_s = -.243$, $n = 32$, $p > .05$).

Table 3.5 correlation coefficients between symptoms, social support, psychological morbidity and coping (N=32)

	RPQ Total	Social Total	Significant Other	Family	Friends	Depression Total	Anxiety Total	Active Focused Coping	Emotion Focused Coping	Avoidant Coping
RPQ Total	1.000	-.351*	-.243	-.163	-.291	.683**	.686**	-.605**	.441*	.421*
Social Total		1.000	.873**	.848**	.542**	-.165	-.293	.464**	.172	.075
Significant Other			1.000	.889**	.177	-.054	-.170	.448*	.303	.147
Family				1.000	.177	-.095	-.238	.431*	.139	.176
Friends					1.000	-.247	-.102	.146	-.043	-.226
Depression Total						1.000	.673**	-.517**	.413*	.314
Anxiety Total							1.000	-.445*	.541**	.443*
Active Focused Coping								1.000	-.135	-.050
Emotion Focused Coping									1.000	.717**
Avoidant Coping										1.000

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Relationship between symptoms and psychological morbidity

It was predicted that symptom prevalence would be positively associated with depression and anxiety scores. Table 3.5 shows that there were highly significant positive correlations between RPQ and depression ($r_s=.683$, $n=32$, $p<.01$) and between RPQ and anxiety ($r_s=.686$, $n=32$, $p<.01$). The coefficients indicated that as symptoms increased so did depression and anxiety.

In order to control for anxiety a partial correlation was conducted. A strong positive relationship emerged between symptoms of RPQ and depression ($r=.517$, $n=29$, $p<.01$) with high scores in the RPQ being associated with higher levels of depression. An inspection of the zero order correlation ($r=.764$) suggested that controlling for anxiety had very little effect on the strength of the relationship between these two variables.

To control for depression a partial correlation between symptoms of RPQ and anxiety was carried out. The results revealed that high levels of RPQ were associated with higher levels of anxiety ($r=.393$, $n=29$, $p<.05$). An inspection of the zero order correlation ($r=.721$) suggested that controlling for depression had an effect on the strength of the relationship between these two variables. This change in relationship strength was weakened where levels of significance decrease from $p<.01$ to $p<.05$.

Relationship between symptoms psychological morbidity and social support

In order to control for social support a partial correlation was undertaken between RPQ and depression. There was a strong positive partial correlation between symptoms of

RPQ and depression ($r=.753$, $n=29$, $p<.01$) with high levels of RPQ being associated with high levels of depression. An inspection of the zero order correlation ($r=.764$) suggested that controlling for social support had very little effect on the strength of the relationship between these two variables.

Another partial correlation was undertaken to look at the relationship between RPQ and anxiety whilst controlling for social support. The statistical tests revealed a strong positive partial correlation between symptoms of RPQ and anxiety ($r=.706$, $n=29$, $p<.01$) with high levels of RPQ being associated with high levels of anxiety. An inspection of the zero order correlation ($r=.721$) suggested that controlling for social support had very little effect on the strength of the relationship between these two variables.

Relationship between symptoms and coping style

It was predicted that symptoms would be negatively associated with active coping scores and positively associated with avoidance and emotion focused coping scores. Table 3.4 shows that there was a highly significant negative relationship between RPQ scores and the active focused sub-scale of the COPE ($r_s=-.605$, $n=32$, $p<.01$). This negative correlation suggests that increases in active coping were associated with decreases in symptoms. A significant positive correlation emerged between RPQ scores and emotional focused sub-scale of the COPE ($r_s=.441$, $n=32$, $p<.05$). The coefficient indicates that as symptom levels increased so did levels of emotion focused coping. Similarly, a positive relationship was identified between RPQ and the avoidant

focused coping sub-scale of the COPE, ($r_s=.421$, $n=32$, $p<.05$). This correlation also suggests that as symptom levels increased so did levels of avoidant focused coping.

Relationship between symptoms, coping style and social support

In order to control for social support whilst looking at the relationship between symptoms of RPQ and active coping a partial correlation was undertaken. Higher levels of RPQ were associated with lower levels of active coping ($r=-.579$, $n=29$, $p<.01$). An inspection of the zero order correlation ($r=.621$) suggested that controlling for social support had very little effect on the strength of the relationship between these two variables.

A partial correlation was carried out in order to control for social support whilst looking at the relationship between RPQ and emotion focused coping. A strong positive partial correlation between symptoms of RPQ and emotion focused coping ($r=.528$, $n=29$, $p<.01$) was revealed. Higher levels of RPQ were associated with increased levels of emotion focused coping. An inspection of the zero order correlation ($r=.432$) suggested that controlling for social support had an effect on the strength of the relationship between these two variables. This change in relationship strength was strengthened where levels of significance increase from $p<.05$ to $p<.01$.

A partial correlation was conducted in order to control for social support whilst looking at the relationship between RPQ and avoidant coping. A strong positive partial correlation between symptoms of RPQ and avoidant coping ($r=.567$, $n=29$, $p<.01$) was

identified where higher levels of RPQ were associated with increased levels of active coping. An inspection of the zero order correlation ($r=.529$) suggested that controlling for social support had an effect on the strength of the relationship between these two variables.

Relationship between symptoms coping style and psychological morbidity

A strong negative partial correlation between symptoms of RPQ and active coping ($r=-.535$, $n=29$, $p<.01$) was identified whilst controlling for psychological morbidity. Test revealed that higher levels of RPQ were associated with lower levels of active coping. An inspection of the zero order correlation ($r=.621$) suggested that controlling for psychological morbidity had very little effect on the strength of the relationship between these two variables.

No partial correlation was identified between symptoms of RPQ and emotion focused coping ($r=-.008$, $n=29$, $p>.05$) whilst controlling for psychological morbidity. An inspection of the zero order correlation ($r=.432$) suggested that psychological morbidity had an effect on the strength of the relationship between these two variables. This change in relationship strength was weakened where levels of significance decreased from $p<.01$ to $p>.05$.

No partial correlation was identified between symptoms of RPQ and avoidant coping ($r=.266$, $n=29$, $p>.05$) whilst controlling for psychological morbidity. An inspection of the zero order correlation ($r=.529$) suggested that psychological morbidity had an

effect on the strength of the relationship between these two variables. This change in relationship strength was weakened where levels of significance decreased from $p < .01$ to $p > .05$.

Chapter 4 ~ Discussion

4.1 Discussion of findings

The aim of the current study was to identify if a particular coping strategy gave rise to an increase or decrease in reported symptoms following a mild head injury. In addition a number of other relationships were to be explored, including the potential relationships between post concussion symptoms, social support, depression and anxiety. The detrimental relationships between post concussion symptoms, psychosocial ability and psychological morbidity were identified in this study. Additionally particular coping styles have been identified to be associated with an increase and decrease in symptom reporting. The aforementioned areas will be discussed in turn:

Symptoms of mild brain injury and social support

The findings suggest that within the mild head injured group, a relationship exists between perceived ability to gain appropriate social support from others and symptoms of post concussion syndrome. Unfortunately the causal relationship is still unknown in that uncertainty exists as to whether a lack of social support leads to an increase in symptoms or if an increase in symptoms leads to a decrease in social support.

The study did not set out to identify the pre-morbid style of the social support provided to the mild head injured individual. One could consider that different support styles such as active, inactive or overly active support may give rise to differences in symptom reporting. If one were to take a behavioural view one could postulate that active social support (which could be viewed as optimum social support) could provide

the injured individual with the adequate levels of social support and guidance that they require under the circumstances, whereas inactive social support could trigger an increase in symptom reporting in order to achieve the required levels of social support. In addition, one could postulate that overly active social support may also rise to an increase in symptom reporting as the sufferer believes that this is what is required to maintain the contact of the supporter requires. Potentially, the increased symptom reporting may actually be detrimental to the quality of the social support.

Conversely, McCauley et al., (2001) suggest that to fully benefit from social support one must be adequately skilled in implementing its interacting factors. Symptoms of mild brain injury could be hampering individual's abilities to engage in the skills that are required to execute these interacting factors.

More specifically, this finding could be explained in terms of Festinger's (1954) Social Comparison Theory, where sufferers of mild head injury view themselves as different from their social supporters. As a result they distance themselves by means of negative comparisons between themselves and those with whom they would normally gain social support from. These comparisons lead to a reduction in positive assessment of perceived social support. This explanation could explain the identified negative correlation between symptoms and social support; where increased post concussion symptoms lead to a greater perceived comparison gap.

In addition, the findings could be supported by the postulations of Langford et al., (1997) whereby post concussion symptoms hamper an individual's ability to engage in

social reciprocity thus affecting social competence and rendering social support ineffective.

Thus far, the results suggest that in addition to experiencing symptoms, individuals suffering from a mild head injury may also experience problems in their perception of support from those whom they would normally turn to. The perception of an ineffective support system could lead to further isolation and reduce their ability to perceive any existing social support as effective.

Symptoms of mild brain injury and psychological morbidity

As predicted in the hypothesis, individuals suffering from symptoms of a mild head injury are more likely to experience co-morbid depression and anxiety. Cicerone & Fraser (2000) suggest that this increase in psychological morbidity is a result of feelings of loss, and/or recognition of reduced ability. The individual is subsequently unable to participate in situations as effectively in comparison to pre morbid levels of functioning. The appraisal of this perception of reduced ability leads to feelings of loss; loss of confidence, self worth/esteem and consequently a reduction in mood.

Potentially the individual may feel threatened by situations that highlight reduced ability, thus leading to feelings of anxiety. Anxiety often arises as a result of what an individual perceives as a threat. A cycle of anxiety reinforcement can develop when situations that trigger these threats are successfully avoided.

These feelings associated with depression and anxiety, although not found to be directly associated with social support (Bay et al, 2002), could be reinforced by lack of social comparison and/or social reciprocity. When a partial correlation was undertaken no relationship was found between post concussion symptoms, psychological morbidity and social support. This means that the relationship between post concussion symptoms, depression and anxiety identified in this study can not be accounted for by lack of social support.

The findings from this partial correlation suggest that increased post concussion symptoms co-exist with increased psychological morbidity within this Highland-based population and are not directly associated with social support.

Coping style and symptoms of mild brain injury

Coping style has been seen to be stable over time, this study has identified that a reduced engagement in active coping style is associated with an increase in symptom reporting. Active coping requires the ability to identify a specific problem, or stressor, and concurrently the ability to act to alleviate the effects of that stressor. In this case the mild head injured group are discharged from A&E having received little to no information explaining the likely symptoms they may experience, thus they are often not explicitly aware of the problem or deficit they may be suffering. This lack of understanding or recognition of the problem may confound an individual's ability to act upon the stressor, i.e. initiate an active coping strategy. As a result, a reduction in active coping may occur. Evidence does exist to suggest that intervention with

information and discussion of coping strategies is beneficial to this population (Ponsford et al, 2002), however it is not clear if this increases ability to engage in active coping.

This study has identified that perceived social support is reduced in individuals with a mild head injury. Carver et al, (1989) suggest that social support is likely to play an important contribution to the ability to initiate active coping strategies in the general population. The effectiveness of social support could be undermined due simply to a lack of information or knowledge regarding the likely symptoms. Carver et al (1989) also stated that without the social support of others, the ability to initiate active coping strategies is likely to be even more significantly undermined. In light of the work of Carver (1989), it is difficult to identify if active coping is undermined by social support or symptoms. To clarify this issue in this population, a partial correlation was carried out to identify if controlling for social support affected the relationship between coping style and symptom reporting. The findings suggest that social support had little effect upon the relationship between active coping and symptoms in this mild head injured population.

Despite the finding that social support does not effect the engagement of active coping in this population, we have identified that those who experience difficulties in undertaking direct steps to actively tackle stressors will also suffer from increased post concussion symptoms.

As engagement in effective active coping is hampered, less effective or inappropriate coping strategies are likely to predominate thus leading us to consider the likelihood that an increase in emotion focused coping would lead to an increase in post concussion symptoms. One could argue that through uninformed and unsuccessful attempts to actively cope with persistent symptoms of mild head injury the situation is viewed as something that must be endured (Folkman & Lazarus, 1980). This could be explained as a result of negative behavioural attempts to control the situation through active participation, negative cognitions arise which create a sense of learned helplessness. Indeed, the view of Folkman & Lazarus (1980); that the situation must be endured; is a central feature of emotion focused coping. The sufferer seeks sympathy and moral support from others as opposed to specific problem solving ideas, assistance or information. This style of support is indicative of lack of social reciprocity, where the sufferer seeks a one-sided degree of social support. In this manner, one could postulate that an interactive relationship between coping style, symptoms and social support exists, however detrimental. A partial correlation did not support this inference.

This finding would suggest that engagement in emotion focused coping is directly linked to increased symptom reporting.

Further investigations looking at the shared relationships held between emotion focused coping, post concussion symptoms and the other variables within the study revealed that psychological morbidity was an influential variable. Those engaging in emotion focused coping strategies are more likely to report an increase in symptoms of mild head injury in the presence of depression and or anxiety.

Additionally, increased engagement in avoidant coping strategies has been found to be associated with an increase in symptoms of mild head injury. Engagement in these strategies is viewed as an attempt to avoid addressing the stressful symptoms or situation. In applying avoidant strategies individuals are more likely to either engage in alcohol or drug usage or withdraw from situations. Further analysis using a partial correlation revealed that social support did not influence this engagement, however the test identified that psychological morbidity did have an effect. As with emotion focused coping, an increase in avoidant coping strategies was more prevalent in the mild head injured population. Those engaging in avoidant coping were more likely to report symptoms in the presence of depression and or anxiety.

4.2 General discussion

On the whole the findings from the study indicate that a mild head injury can produce symptoms that can affect many areas of an individuals' life. In the face of these difficulties, the majority of individuals in this study have persevered with on-going activities of 'normality' such as work and further education. The findings of this study contrast with theoretical views of recovery as 'the ability to return to work' (Price & Baumann, 1990) as 68 per cent of respondents continued to work whilst experiencing symptoms. In the main, the mild head injured group is able to return to work, but whilst doing so, evidence from this study suggest that they endure marked difficulties which may affect their social abilities, cognitive performance, general recovery and long term prognosis. This area of mild head injury has undergone little research. This

means that there is still little known about this group in terms of duration of recovery and return to 'normal' functioning.

The study has identified that the post concussion symptoms that arise from a minor head injury are, for many, still present past the three month period. This finding contrasts with popular belief that mild head injury resolves itself within three months (Dikmen, McLean & Tempkin, 1986; Alves et al., 1986; Evans, 1992). However, this finding is in keeping with previous research that has identified a significant minority still reporting symptoms beyond the three month period (Mateer & D'Arcy, 2000; Ponsford, Willmott & Rothwell, 2000) this further supports the need for on-going research in this population to identify the extent to the difficulties reported and the relationships between these difficulties.

Post concussion symptoms appear to be the common denominator within the relationships studied (symptoms of mild head injury, psychosocial ability, psychological morbidity and individual coping style). The variables do not appear to function within a cyclical pattern instead they seem to be influenced directly by post concussion symptoms. The findings of this study corroborate findings from previous studies undertaken by other health related groups (Krakow, Buhler & Haltenhof; 1999, Murray, 1993) which identify a correlation between coping style, health outcomes, social adaptation and mental health difficulties. It is not explicit if the variables within these studies work in a self fulfilling cascade of symptoms or in a common denominator pattern as identified within this study.

The main aim of the study was to identify if a particular coping strategy gives rise to an increase or decrease in reported symptoms following mild head injury. The study has identified that a reduction in what are considered “productive active coping strategies” gives rise to an increase in symptoms. It has also been noted that engagement in less effective coping strategies such as emotion focused and avoidant coping provokes an increase in symptom reporting. The study has also identified a) that an increase of post concussion symptoms negatively affects ones perception of social support, and b) an increase in post concussion symptoms is related to an increase in co-morbid depression and anxiety.

4.3 Theoretical discussion

Post concussion symptoms resulting from a mild head injury can be viewed as multi factorial. This study illustrates that the primary symptoms associated with post concussion often lead to secondary non-organic difficulties. These difficulties have been found to affect many areas of an individual’s ability to function including; perception of relationships with others; increase in depression and anxiety; and; the ability and approach to difficulties.

The multi factorial effects from mild brain injury support the stress, coping and vulnerability model, where otherwise functional resources have been diminished (Martelli, Braith, & MacMilan, 1992) as a result of the symptoms resulting from the blow to the head.

If we were to apply the stress, coping and vulnerability model (Martelli, Braith, & MacMilan, 1992) we would assume that individuals were adequately pulling upon functional resources prior to the injury. The study identified that symptoms of mild head injury influence a number of areas of daily functioning including psychosocial ability, psychological morbidity and individual coping style. The resulting diminished resources could increase stress, clearly does affect coping and could render the individual more vulnerable to long term difficulties.

The stress, coping and vulnerability model does not however, consider pre-morbid resources and/or difficulties. If pre-morbid resources were low the effects of the symptoms of mild brain injury could be exacerbated as a result and vice versa. This is the view of the threshold model where with increasing severity of injury different thresholds are encountered giving rise to different, more severe levels or categories of symptoms.

Post concussion symptoms do not affect everyone. The majority of individuals in this study had the same GCS “despite significant differences in symptomology and severity of impairment”. Therefore Satz’s (1993) threshold model appears to provide the best explanation of the findings enabling us to explain why some individuals experience no symptoms while others appeared to be overwhelmed by symptoms. In order to truly apply this model research would need to look at pre-morbid characteristics in greater depth than this study was able.

4.1.5 Limitations

Through the process of conducting the study a number of subsequent limitations were identified. These five limitations hinged mainly upon the lack of knowledge within a number of pre-morbid areas of functioning:-.

Information regarding pre-morbid intelligence (IQ) could have identified if a change in IQ arose from a mild head injury and a potential relationship between IQ and coping style.

In terms of social support, it would have been interesting to have identified if perceived levels of social support had changed as a result of the injury.

In order to truly control for change in psychological functioning it would have been useful to identify pre-morbid psychological state and any long term psychological conditions, however within the context of this study this would have been difficult to achieve.

Closer consideration of these factors and a control sample would permit a much better understanding of the inter-relationships between the factors and co-factors involved in determining needs in the mild head injured population. Addressing these limitations in a controlled manner would enable one to truly conclude upon significant changes resulting from a blow to the head and truly place these within a theoretical context.

A number of difficulties were encountered during the early stages of data gathering which resulted in the discarding of a significant number of records from the study. As an example the A&E database was in its infancy and a number of fields were not complete. This reduced the sample size considerably. This had the effect of greatly reducing the numbers of potential participants in the study which in turn affected the statistical power and consequently the degree of data analysis that could be carried out. This could be addressed by repeating the study with new patients rather than mining previous records, however due to constraints upon the time frame for this study, this would not have been possible.

4.1.6 Future studies/Recommendations

This study has identified that significant data gaps exist in the literature considering the population studied and outlines where more research could define a relatively straightforward and cost effective improvement in the management of the mild head injured population through potentially passive (literature provision) as well as active psychological intervention .

It identifies that perhaps, despite it's applicability and proven strengths in the acute head injured population, the GCS system does not adequately describe the symptomology and degree of impairment suffered on account of a mild head injury to inform practitioners of appropriate patient management. This is highlighted by considering that mild head injury accounts for only three of the GCS categories, yet accounts for 80% of the head injured population.

It can be concluded that mild head injury is an area of medical and psychological research that has been in the main overlooked, but is an example where psychologists can play an important role in determining appropriate patient management in what is traditionally considered an acute medico-surgical field (Accident and Emergency).

Significant data gaps exist in our understanding of the prevalence and degree of impairment and longevity of impairment within this population. More work is required in order to highlight the degree and breadth of daily difficulties experienced by this significant cohort of patients.

On the back of this study future research should focus upon identifying if a causal relationship exists between the factors of symptoms, social support, psychological morbidity and coping style. Furthermore studies should consider appropriate intervention strategies and the effects upon symptoms and their reporting. To put the research in context for decision makers and government, it would also be interesting and important to quantify, if possible, the societal effect and “cost” in terms of post incident absenteeism or lost work days, and increased reporting of indirect illness.

In addition, considering the prevalence of depression and anxiety in society in general, future studies should look to identify pre-morbid factors in a bid to identify if symptoms of mild head injury significantly exacerbate the difficulties encountered in these areas of functioning.

4.1.7 Conclusions/Implications of the study

In conclusion this study has identified that symptoms of mild head injury are real to the sufferer. These symptoms may be influenced by pre-morbid characteristics but are certainly not predicted by GCS.

Less effective and in-appropriate styles of coping such as emotional and avoidant coping co-exists with increased symptom reporting. The study has identified that in addition to directly addressing coping styles, the practitioner should also look to measure and address symptoms of depression and anxiety where these exist. This strategy is likely to be more effective as successful tools are available to the experienced practitioner to address and reduce symptoms of depression and anxiety; and the adoption of more productive active coping strategies is directly related to reduced levels of post-concussion symptoms.

Reference

Reference

Abbott, J. (2003) Coping with cystic fibrosis. *Journal of the Royal Society of Medicine*, 96 (43):42-50.

Alexandre A, Colombo, F, Nertempi, P and Benedetti, A . (1983). Cognitive outcome and early indices of severity of head injury. *Journal of Neurosurgery*, 59:751-61.

Aldwin, C, & Revenson, T. (1987)Does Coping help? A re-examination of the relation between coping and mental health. *Journal of Personality & Social Psychology*, 53:337-48.

Alves, W. M., Colohan, A. R. T., O’Leary, T. J., Rimmel, R. W., & John, J. A. (1986). Understanding post traumatic symptoms after minor head injury. *Head Trauma Rehabilitation*, 1:1–12.

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders (1994).Fourth Edition. Washington, DC, American Psychiatric Association, (APA).

Bay, E., Hagerty, B. H., Williams, R. A., Kirsch, N. & Gillespie, B. (2002) Chronic Stress, Sense of Belonging, and Depression Among Survivors of Traumatic Brain Injury. *Journal of Nursing Scholarship*, 34 (3):221–26.

Bennett, T. L., & Raymond, M. J. (1997) Emotional Consequences and Psychotherapy for Individuals with Mild Brain Injury. *Applied Neuropsychology*, Vol 4 (1): 55-61.

Bohnen, N., Twijnstra, A., & Jolles, J. (1992), Post-traumatic and emotional symptoms in different sub-groups of patients with mild head injury. *Brain Injury*, 6:481–86.

British Psychological Society (BPS). (2006) Ethics and Code of Conduct. www.bps.org.uk/the-society/ethics-rules-charter-code-of-conduct/code-of-conduct/code-of-conduct_home.cfm. Viewed 30th October 2006.

Brooks, N., Campsie, L., Symington, C., Beattie, A & McKinlay, W. (1986) The five year outcome of Severe blunt head injury; A relatives View. *Journal of Neurology Neurosurgery & Psychiatry*, 46:336–44.

Bjelland, I., Dahl, A.A., Haug, T. & Nickelmann, T. (2002) The validity of the Hospital Anxiety and Depression Scale: An updated literature review. *J. Psychosom Res*, 52:69-77.

Carroll, L. J, Cassidy, J. D. Holm, L., Kraus, J., & Coronado, V. G. (2004). Methodological issues and research recommendations for mild traumatic brain injury: The WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury. *Journal of Rehabilitation Medicine*, 43 (supplement):113–125.

Carroll, L.J, Cassidy, J.D, Peloso, P.M, et al (2004). Prognosis for mild traumatic brain injury: results of the WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury. *J Rehabil Med*, 43 (Supplement):84–105.

Carver, C. S. & Scheier, M.F. (1985). Self-consciousness, expectancies and the coping process. In: T. Field, P. M. McCabe & N. Schneiderman (Eds). *Stress and Coping*. pp. 305-30. Hillsdale; NJ Erlbaum.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56: 267-283.

Cicerone, K. D., & Fraser, R. T. (2000) Counselling interactions for clients with traumatic brain injury. In: Fraser, R. T., & Clemmons, D. C. (Eds). *Traumatic Brain Injury Rehabilitation*. pp. 99. New York: CRC Press.

Cohen, J., (1992). A power primer. *Psychological Bulletin*, 112:155–159

Dahlem, N.W., Zimet, G.D. & Walker, R.R., (1991). The multidimensional scale of perceived social support: a confirmation study. *Journal of Clinical Psychology*, 47:756–761.

Dawkins, N., Cloherty, M. E., Gracey, F. & Evans, J. J. (2006). The factor structure of the Hospital Anxiety and Depression Scale in acquired brain injury. *Brain Injury*, 20(12):1235–39.

Dikmen, S. S. Tempkin, N., & Armsden, G. (1989). Neuropsychological recovery: the relationship to psychosocial functioning and post-concussional complaints. In: Levin, H, Eisenberg, H. M., & Benton, A. L., (Eds). *Mild head injury*. pp. 229–241 New York: Oxford University Press.

Dikmen, S. S., McLean, A, Tempkin, N. (1986) Neuropsychological and psychosocial consequences of minor head injury. *J Neurol Neurosurg Psychiatry*, 49:1227–1232.

Evans, R. W. (1992). The post-concussion syndrome and the sequel of mild head injury. *Neurol Clin*, 10:815–47.

Folkman, S., & Lazarus, R. S. (1980) An analysis of coping in as middle aged community sample. *Journal of Health and Social Behaviour*, 21:219–239.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: A study of emotion and coping during three stages of a collage examination. *Journal of Personality and Social Psychology*, 48:150–170.

Frenzel, M. P., McCaul, K. D., Glasgow R. E. & Schafer, L. C. (1988). The relationship of stress and coping to regimen adherence and glycemic control of diabetes. *J Soc Clin Psychol*, 6:77–87.

Freud, S. (1933). New introductory lectures on psychoanalysis. New York: Norton.

Grownwall, D. (1991) Minor Head Injury. *Neuropsychology*, 4:253–265.

Gronwall, D. & Wrightson (1974). Delayed recovery of intellectual function after minor head injury. *Lancet* ii, 605-9.

Gronwall, D. & Wrightson (1975). Cumulative effects of concussion.. *Lancet* ii, 995-7.

Harrison, R. A., & Cock, D. (2004). Increasing response to a postal survey of sedentary patients – a randomized controlled trial. *BMC Health Services Research*, 4:31.

Helm, E, Augustiny, K. F., Schaffner, L.& Valach, L. (1993). Coping with breast cancer over time and situation. *J Psychosom Res*, 37:523–42.

Hilton, J. (1877) Lectures on rest and pain. (2nd Edition) London: George Bell & Sons.

Iverson, G. L. (2006) Complicated vs uncomplicated mild traumatic brain injury: Acute neuropsychological outcome. *Brain Injury*, 20(13 – 14):1335–1344.

Iverson, G. L., Lovell, M. R., Smith, S., & Franzen, M. D. (2000). Prevalence of abnormal CT- scans following mild head trauma. *Brain Injury*, 14:1057–1061.

Jean, V., Paul, R. H., & Beatty, W. W. (1999). Psychological and neurological predictors of coping patterns by patients with multiple sclerosis. *J Clin Psychol*, 55:21–6.

Jennett, B. (1989) Some international comparisons. In: Levin, H.S, Eisenburgh, H. M. & Benton, A.L., (Eds). Mild head injury. pp. 23-24 New York: Oxford University Press.

Jennett, B., & MacMillan, R. (1982) Epidemiology of head injury. *BMJ*, 282:101-4.

Jennette, B., Teasdale, G., Braakman, R., Minderhoud, J., Heiden, J. & Kurtze, T. (1979) Pognosis of patients with sever head injury. *Neurosurgery*, 4:283-9.

Johnston, M. V & Hall, K. M. (1994). Outcomes evaluation in TBI. *Archives of Physical Medicine and Rehabilitation*, 75: 2-26.

Kay, T.(1992). Neuropsychological Diagnosis: disentangling the multiple determinants of functional disability after mild traumatic brain injury. In: Horn, L.J., & Zasler, N. D. (Eds). *Rehabilitation of Post Concussive Disorders*. pp.109–128 Philadelphia: Hanley & Belfus, Inc.

Karlein, M., Schreurs, G. & De Ridder, D., T., D. (1997). Integration of coping and social support perspectives: Implications for the study of adaptation to chronic diseases. *Clinical Psychology Review*; Vol 17:89-112.

Kazarian, S.S. & McCabe, S.B., (1991). Dimensions of social support in the MSPSS: factorial structure, reliability, and theoretical implications. *Journal of Community Psychology*, 19:150–160.

King, N. S., Crawford, S., Wenden, F. J., Moss, N. E. G., & Wade, D T. (1995) The Rivermead Post Concussion Symptoms Questionnaire: a measure of symptoms commonly experienced after head injury and its reliability. *J. Neurol*, 242:587–92.

Krakow, K., Buhler, K. E.& Haltenhof, H. (1999) Coping with refractory epilepsy. *Seizure*, 8:111–5.

Krakow, K., Haltenhof, H & Buhler, K. E. (1999). Coping with Parkinson's disease and refractory epilepsy: a comparative study. *J Nerv Ment Dis*, 187(8):503–8.

Kupst, M. J., & Schulman, J. I. (1998) Long term coping with paediatric leukaemia: a six year follow-up study. *J Pediatr Psychol*, 13:7–22.

Kurtz, K. E., & Kurland, L. T. (1993) The epidemiology of neurologic disease. In: R. J. Joynt (Ed). *Clinical Neurology*. Chapt 66 Philadelphia: JB Lippincott.

Langford, C. P. H., Bowsher, J., Maloney, J. P. & Lillis, P.P. (1997) Social support: A conceptual analysis. *Journal of Advance Nursing*; 25:95–100.

Lazarus, R. S. & Launier, R. (1978) Stress related transactions between person and the environment. In: Pearvin, LA & Lewis M, (Eds). *Perspectives in International Psychology*. pp.287–237 New York: Plenum.

Lazarus, R. S. & Folkman (1984). *Stress appraisal and coping*. New York: NY Springer.

Lazarus, R. S. (1990). Stress, coping and illness. In: H.S. Friedman (Ed). *Personality and disease*. pp. 99 Chichester, Uk: John Wiley & Sons.

Levin, H. S, Benton, A. L, Grossman, R. G. (1982) *Neurobehavioral Consequences of Closed Head Injury*. New York: Oxford University Press.

Levin HS, O'Donnell VM, Grossman RG, (1979). The Galveston Orientation and Amnesia Test. A practical scale to assess cognition after head injury. *J Nerv Ment Dis*,167(11):675-84.

Levin, H. S., Williams, D. H., & Eisenberg, H. M. (1992) Serial MRI and neurobehavioural findings after mild to moderate closed head injury. *Journal of Neurology, Neurosurgery and Psychiatry*,55:255–262.

MacCarthy, B, & Brown, R., (1989) Psychosocial factors in Parkinson's disease. *British Journal of Clinical Psychology*, 28: 41–52.

Martelli, M. F., Braith, J. A. & MacMillan, P. J. (1992). Stress, appraisal and coping model for rehabilitation following traumatic brain injury. Presented at the Cognitive Rehabilitation: Community Reintegration through Scientifically Based Practice, 6th Annual Meeting, Richmond, Virginia.

Marion, D. W., & Carlier, P. M. (1994). Problems with initial Glasgow Coma Scale assessment caused by pre-hospital treatment of patients with head injuries: results of the national survey. *Journal of Trauma*, 36: 89-85.

Mayer, N.H., Kearting, D.J., & Rapp, D. (1986). Skills routines and activity patterns of daily living: A functional nested approach. In: B. Uzzell & Y. Gross (Eds.) *Clinical Neuropsychology of Intervention*. pp.211 Boston: Martinus Nijhoff.

Mateer, C. A., D'Arcy, R. C. N. (2000). Current concepts and approaches to management. In: Raskin SA, Mateer CA, (Eds). Neuropsychological management of mild traumatic brain injury. pp. 3-22 New York: Oxford University Press.

McCauley, S. R.B., Corwin, L, Harvey S. C., Charles, F. & Song, J. X. (2001). Post concussional disorder following mild to moderate traumatic brain injury: Anxiety, depression, and social support as risk factors and co morbidities. *Journal of Clinical and Experimental Neuropsychology*, 23(6):792-808.

McKinlay, W. (1981).The short-term outcome of severe blunt head injury as reported by relatives of the injured persons. *Journal of neurology, Neurosurgery and Psychiatry*, 44:527–533.

Medical Disability Society (1988). *The management of traumatic brain injury*. London: Royal College of Physicians.

Murray, J. (1993). Coping with uncertainty of uncontrolled epilepsy. *Seizure*, 2:167–78.

Mittenburg, W., Di Giulio, D. V., Perrin, S., & Bass, A. E. (1992). Symptoms following mild head injury: expectation as aetiology. *J Neurosurg Psychiatry*, 55:200–204.

Nell, V., Yates, D. W., & Kruger, J. M. A. (2000) An extended Glasgow Coma Scale (GCS – E) with enhanced sensitivity to mid brain injury. *Arch Phys Med Rehabil*, Vol 81.

Parkes, K. R. (1984) Locus of control, cognitive appraisal and coping in stressful episodes. *Journal of Personality and Social Psychology*, 46. 655-68

Pallant, J. (2004) **SPSS survival manual: a step by step guide to data analysis using SPSS for windows (version 12).** (2nd edition). Buckingham: Open University.

Pepping, M. & Rourke, J.R. (1990) Psychosocial consequences of significant brain injury. In: D.E. Tupper & K.D. Cicerone (Eds). *The Neuropsychology of Every Life: Issues in Development and Rehabilitation*. Boston: Kluwer Academic.

Pettigrew, M., Bell, R. & Hunter, D. (2002). Influence of psychological coping on survival and recurrence in people with cancer: systematic review. *BMJ*, 325:1066.

Powell, T. (2005). *Head Injury. A practical Guide. (Revised Edition).* pp.20 UK: Speechmark Publishing.

Ponsford, J L, Wilmott, C., & Rothwell, A. (2000). Factors influencing outcome following mild traumatic brain injury in adults. *J Int Neuropsychol Soc*, 6:568-579.

Ponsford, J. L., Wilmott, C., Rothwell, A., Cameron, P., Kelly, A-M., Nelms, R., & Curran, C. (2002) Impact of early intervention on outcome following mild head injury in adults. *Journal of Neurology, Neurosurgery, and Psychiatry*, 73:330–332.

Ponsford J.L., Willmott C, Rothwell A, Kelly A-M, & Nelms R, (2004) Use of the Westmead PTA Scale to monitor recovery of memory after mild head injury. *Brain Injury*, 18(4):603-614

Price, P. & Baumann, W.L. (1990) Working: The key to normalization after brain injury. In: D.E. Tupper & K.D. Cicerone (Eds). *The Neuropsychology of Every Life: Issues in Development and Rehabilitation*. Boston: Kluwer Academic.

Prigatano, G. (1996) *Neurological Rehabilitation After Brain Injury*. Baltimore: The Johns Hopkins Press.

Rosenbaum, M, & Palmon, N.C. (1984) Helplessness and resourcefulness in coping with epilepsy. *Journal of Consulting Clinical Psychology*, 52:244-53

Richardson, J. E. T. (1990) Clinical and neuropsychological aspects of closed head injury. pp78 London: Taylor Francis.

Rimel, Giordani, Barth, Boll, & Jane. (1981). Disability caused by minor head injury. *Neurosurgery*, 9:221-5

Rose, F. D., & Johnston, D. A. (1996) (Eds). Brain injury and after. Towards improved outcome. Chichester: John Wiley & sons Ltd.

Ruff, RM, Marshall, J, Crouch, MR, et al. (1993) Predictors of outcome following severe head trauma: Follow-up data from the traumat/ic coma data bank. *Brain Injury*, 7(2):101-113.

Russell, W. R. (1932) Cerebral involvement in head injury. *Brain*, 55, 549. In: Sacks, O. (1985) *The man who mistook his wife for a hat*. London: Duckworth.

Rutherford, W. H. (1989). Post –concussion symptoms: relationship to acute neurological indices, individual differences, and circumstances of injury. In: Levin, H, Eisenberg, H. M., & Benton, A. L., (Eds). *Mild head injury*. Pp. 217–228 New York: Oxford University Press.

Sacco, W. P., & Yanover, T. (2004) Diabetes and Depression: The Role of Social Support and Medical Symptoms *Journal of Behavioral Medicine*, Vol 29:523 – 31.

Setnik, L., & Bazarian, J. J. (2006) The characteristics of patients who do not seek medical treatment for traumatic brain injury. *Brain Injury*, 21(1):1 – 9.

Sheridan, C. L. & Radmacher, S. A. (1992) *Health Psychology: Challenging the biomedical model*. Chichester: John Wiley & Sons.

SNAP - Scottish Needs Assessment Programme (1998) Report on Huntington's Disease, Acquired Brain Injury and Early Onset Dementia.

Snyder, M. (1993). Stressor, coping mechanisms, and perceived health in persons with epilepsy. *Int Disabil Stud*, 12:100–3.

Sosin, D. M., Snizek, J. E., & Thurman, D. J. (1996) Incidence of mild and moderate brain injury in the United States. *Brain Injury*, 10:47–45.

Stanley, M.A., Beck, J.G. & Zebb, B.J., (1998). Psychometric properties of the MSPSS in older adults. *Aging and Mental Health*, 2:86–193.

Teasdale, G., & Jennett, B. (1974). Assessment of coma and impaired consciousness: A practical scale. *Lancet*, 2:81 – 84.

The Scottish Intercollegiate Guidelines Network (2000) 46, Early management of patients with a Head Injury. www.sign.ac.uk/guidelines/published/index.html viewed 30/10/2006.

Thomsen, I. (1984). Late outcome of very severe blunt head trauma: a 10 - 15 year second follow-up. *Journal of Neurological & Neurosurgical Psychiatry*, 47:260-268.

Uomoto, J. M. (2000). Application of the neuropsychological evaluation in vocational planning after brain injury. In: Fraser, R. T., & Clemmons, D. C. (Eds). *Traumatic Brain Injury Rehabilitation*. pp. 97 New York: CRC Press.

Wade, D. T., Crawford, S., Wenden, F. J., King, N. S., & Moss, N. E. G. (1997). Does routine follow up after head injury help? A randomised control trial. *Journal of Neurology, Neurosurgery, and Psychiatry*, 62:478–484.

Wade, D. T., King, N. S., Wenden, F. J., Crawford, S., & Caldwell, F. E. (1998) Routine Follow up after head injury: a second randomised control trial. *Journal of Neurology, Neurosurgery, and Psychiatry*. 65:177–183.

Wilson, B, A. Herbert, C. M. & Sheil, A. (2003) Behavioural approaches in neuropsychological rehabilitation; Optimising rehabilitation procedures. pp. 44 New York: CRC Press.

World Health Organization (1992). The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva, World Health Organization, (WHO).

World Health Organization (1993). The ICD-10 Classification of Mental and Behavioural Disorders: Diagnostic Criteria for Research. Geneva, World Health Organization, (WHO)

World Health Organisation (1978). Mental Disorders: glossary and guide to their classification in accordance with the 9th revision of the international classification of diseases. WHO, Geneva.

Wrightson, P., & Gronwall, D. (1981) Time off work and symptoms after minor head injury. *Injury*, 12:445–454.

Zasler ND. (1997) Prognostic indicators in medical rehabilitation of traumatic brain injury: a commentary and review. *Archives of Physical Medicine and Rehabilitation*, 78(8):12-16.

Zatura, A. J. & Manne, S. (1992), Coping with rheumatoid arthritis: a review of a decade of research. *Ann Behav Med*, 14:31–9

Zigmond, A. S. & Snaith, P. R. (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatr scand*, 67:361–70.

Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K., (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52:30–41.

Zimet, G.D., Powell, S.S., Farley, G.K., Werkman, S. & Berkoff, K.A., (1990).
Psychometric properties of the multidimensional scale of perceived social support.
Journal of Personality Assessment, 55:610–617

BBC News Online:

http://www.bbc.co.uk/health/awareness_campaigns/mar_braininjury.shtml. Viewed
12/01/2007

Appendix 1 ~ A & E Information leaflet



RAIGMORE HOSPITAL

Old Perth Road, Inverness, IV2 3UJ
Tel: 01463 704000 Fax: 01463 705938
Web: www.show.scot.nhs.uk/haht/

EMERGENCY DEPARTMENT

ADVICE SHEET - HEAD INJURY

It is not uncommon to experience several symptoms following a head injury e.g. mild headache, dizziness, memory problems, poor concentration, irritability/being easily annoyed, tiredness and sleep disruption. These symptoms should disappear in time and do not generally require treatment.

Following the advice detailed below will help you recover from your head injury and may prevent some of the symptoms listed above.

Children:

Your child has sustained a head injury and following a thorough examination we are satisfied that the injury is not serious.

- Your child may be more tired than normal. Allow him/her to sleep if they want to.
- Give Calpol or Disprol (paediatric Paracetamol) for any pain or headache.
- Try to keep your child resting for 24 hours.
- If your child should develop any of the following:
 - Headache not relieved by Calpol or Disprol (paediatric Paracetamol)
 - Vomiting
 - Altered vision
 - Irritability
 - Fits
 - Becomes unwakeable

Bring him/her back to hospital or telephone immediately – (01463) 704357 (24 hours)

Adults:

- Ensure a responsible person is available to keep an eye on you for the next 24 hours and show them this card.
- Rest for the next 24 hours.
- Do take painkillers such as Paracetamol to relieve pain and headache.
- Do not drink alcohol for the next 24 hours.
- Do take your normal medication but **do not** take sleeping tablets or tranquillizers without consulting your doctor first.
- If any of the following symptoms occur, then you should return to hospital or contact us for advice – (01463) 704357 (24 hours):

Appendix 2 ~ Ethics committee approval letter

Highland Research Ethics Committee

Assynt House, Beechwood Park,
Inverness, IV2 3BW
Telephone: 01463 717123
Fax: 01463 235189
Textphone users can contact us via
Typetalk: Tel 0800 959598
www.nhshighland.scot.nhs.uk



Ms Emma-Rose Tessler
Trainee Clinical Psychologist
NHS Highland
New Craigs
6 – 16 Leachkin Road
INVERNESS
IV3 8NP

Date: 29 March 2007
Your Ref:
Our Ref:

Enquiries to: Irene Robertson
Extension: 4844
Direct Line: 01463 704844
Email: irene.robertson@hnb.scot.nhs.uk

Dear Ms Tessler

Full title of study: The relationship between coping style and symptoms following mild head injury
REC reference number: 07/S0901/2

Thank you for your letter responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Ethical review of research sites

The Committee has designated this study as exempt from site specific assessment (SSA). The favourable opinion for the study applies to all sites involved in the research. There is no requirement for other Research Ethics Committees to be informed or SSA to be carried out at each site.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:-

Headquarters: Assynt House, Beechwood Park, INVERNESS IV2 3BW

Chairman: Garry Coutts
Chief Executive: Dr Roger Gibbins BA MBA PhD
Highland NHS Board is the common name of Highland Health Board

Document	Version	Date
Application	2	26/02/07
Investigator CV		08/01/07
Supervisor CV		
Protocol	1	08/01/07
Letter from Sponsor		12/12/06
Compensation Arrangements		28/07/06
Questionnaire		
Letter of invitation to participant	2	26/02/07
'Welcome' letter	2	26/02/07
Participant Information Sheet	2	26/02/07
Participant Consent Form	2	26/02/07

Research governance approval

You should arrange for all relevant NHS care organisations to be notified that the research will be taking place, and provide a copy of the REC application, the protocol and this letter.

All researchers and research collaborators who will be participating in the research must obtain research governance approval from the relevant care organisation before commencing any research procedures. Where a substantive contract is not held with the care organisation, it may be necessary for an honorary contract to be issued before approval for the research can be given.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (October 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

07/S0901/2	Please quote this number on all correspondence
------------	--

With the Committee's best wishes for the success of this project.

Yours sincerely



pp **Margaret Dakers Thomson**
Chair

Enclosure: Standard approval conditions (SL-AC2)

Copy to: Miss Emily Newman, University of Edinburgh
Dr Catherine Sinclair, Research Manager, NHS Highland

Appendix 3 ~ Participant invitation

Date: 26th February 2007
Version 2

Emergency Department
Raigmore Hospital
Old Perth Road, Inverness, IV2 3UJ
Telephone 01463 704358
Fax 01463 705938
www.show.scot.nhs.uk/nhshighland/

Invitation

As part of a doctorate in Clinical Psychology I am inviting you to participate in my Doctorate research project.

I intend to use a questionnaire to answer the following question:-

After suffering a mild head injury, Do patients exhibiting alternative coping styles recover better than others?

In a couple of days you will receive a questionnaire pack. This will:-

- a) Explain why you have been invited to participate, and provide some further information, and;
- b) Provide a formal **consent form** and some **questionnaires** for you to complete.

I would be grateful if you would take the time to complete the questionnaires if you can, getting help from family and friends if necessary. You are of course under no obligation to take part when you receive the questionnaire.

The results will be used to allow us to learn from your own personal experiences and tailor improvements to the Highland Accident & Emergency and Outpatient Psychology follow-up services for all patients.

Yours faithfully

Emma-Rose Tessler
Trainee Clinical Psychologist

Under the supervision of
Dr Louise Blackmore (Clinical Neuropsychologist)

Appendix 4 ~ Participant welcome letter

Date: 26th February 2007
Version 2

Emergency Department
Raigmore Hospital
Old Perth Road, Inverness, IV2 3UJ
Telephone **01463 704358**
Fax **01463 705938**
www.show.scot.nhs.uk/nhshighland/

Welcome

Thank you for taking the time to open the questionnaire pack.

As mentioned in the invitation letter that I sent to you, this project is part of my doctorate degree in Clinical Psychology. My project is concerned with **The relationship between coping style and symptoms following mild head injury**

My name is **Emma-Rose Tessler** and I can be contacted by telephoning **01463 704511**

Before you **decide** it is important for you to understand why the research is being done and what it will involve. Please take time to read the attached information sheet carefully. The information sheet will tell you of the purpose of the study and what will happen to you if you take part.

Talk to others if you wish.

If you decide to take part in the study please sign the attached consent form and send it with the completed questionnaires in the provided pre-paid envelope.

Many thanks

Emma-Rose Tessler
Trainee Clinical Psychologist

Under the supervision of
Dr Louise Blackmore (Clinical Neuropsychologist)

Appendix 5 ~ Participant information

Date: 26th February 2007
Version 2

Emergency Department
Raigmore Hospital
Old Perth Road, Inverness, IV2 3UJ
Telephone **01463 704358**
Fax **01463 705938**
www.show.scot.nhs.uk/nhshighland/

Participant Information Sheet

The relationship between coping style and symptoms following mild head injury

You are being invited to take part in a research study. Before you **decide** it is important for you to understand why the research is being done and what it will involve. **Please** take time to **read** the following information carefully. Talk to friends and family members if you wish.

This study is being carried out by Me, Emma-Rose Tessler as part of a Doctorate in Clinical Psychology. You can contact me on **01463 704511** to discuss any aspect of the questionnaire, or to get help in understanding the questions. (Please leave a message on the answer machine if I am not in).

The purpose of the study is to understand more about the factors that could affect symptoms after a head injury. Following mild head injury it is common to experience symptoms such as dizziness, fatigue, irritability and memory problems. Some people experience these symptoms for a short time period, whereas others for a longer period of time. We are looking at the relationships between particular ways of coping, social support and the symptoms experienced following mild head injury.

You have been identified from a record of people that attended Raigmore Hospital Accident and Emergency department with a head injury. We are asking 120 people like yourself who have suffered a mild head injury to complete the enclosed questionnaires. It is up to you to decide whether or not to take part. If you do, you will be asked to sign a consent form. You are still free to withdraw at any time without giving reason. A decision to withdraw at any time, or a decision not to take part, will not affect the your medical care in any way. Participation in the study is strictly confidential, your identity will only be known to me. Your GP will not be notified, unless you wish.

If you decide to take part, please sign the consent form, complete the enclosed questionnaires and return them to me in the pre-paid envelope provided no more than 4 weeks later. They should take approximately 30 minutes to complete.

Yours faithfully

Emma Rose Tessler
Trainee Clinical Psychologist

Appendix 6 ~ Participant consent

Date: 26th February 2007
Version 2

Emergency Department
Raigmore Hospital
Old Perth Road, Inverness, IV2 3UJ
Telephone **01463 704358**
Fax **01463 705938**
www.show.scot.nhs.uk/nhshighland/

Consent Form

Title of project: **The relationship between coping style and symptoms following mild head injury**

Name of researcher: **Emma-Rose Tessler telephone 01463 704511**

Further Information: **Louise Blackmore telephone 01463 704683**

- I agree to participate in this study
- I have read the information form and have had the opportunity to ask questions about the study.
- I understand that I am under no obligation to take part in this study and that a decision to participate will not alter the treatment that I would normally receive.
- I understand that I have the right to withdraw from the study at any stage and that to do so will not affect treatment.

Name of participant

Date

Signature

Name of researcher

Date

Signature

2 copies made one copy to be retained the participant one copy to be sent in the pack for the researcher.

Appendix 7 ~ Questionnaire pack

Questionnaires

Thank you for deciding to participate in my study. Please find attached the 4 questionnaires. The instructions for each questionnaire are provided at the top of each survey.

Please complete the following details before you go on to complete the questionnaires.

Age

Marital Status: Single

Married/cohabiting
Divorced/separated/widowed

Employment:

In education
Employed
Unemployed - seeking work
Unemployed - not seeking work
Self employed
Retired/other

Accident type:

Road traffic accident, including pedestrian
Cyclist
Horse riding
Accident at home
Accident at work
Assault
Sports related
other

Have you had a head injury before? Yes/ No

RPQ

After a head injury or accident some people experience symptoms which can cause worry or nuisance. I would like to know if you now suffer any of the symptoms given below. As many of these symptoms occur normally, I would like you to compare yourself with before the accident. For each one please circle the number closest to your answer.

0= Not experienced at all

1 = no more of a problem

2 = a mild problem

3 = a moderate problem

4 = a severe problem

Compared with before the accident, do you now (i.e. in the last 24hours) suffer from:

Headaches	0	1	2	3	4
Feelings of Dizziness	0	1	2	3	4
Nausea and/or vomiting	0	1	2	3	4
Noise sensitivity,					
easily upset by loud noise	0	1	2	3	4
Sleep disturbance	0	1	2	3	4
Fatigue, tiring more easily	0	1	2	3	4
Being irritable, easily angered	0	1	2	3	4
Feeling depressed or tearful	0	1	2	3	4
Feeling frustrated or impatient	0	1	2	3	4
Feeling forgetfulness, poor memory	0	1	2	3	4
Poor concentration	0	1	2	3	4
Taking longer to think	0	1	2	3	4
Blurred vision	0	1	2	3	4
Light sensitivity,					
Easily upset by bright light	0	1	2	3	4
Double vision	0	1	2	3	4
Restlessness	0	1	2	3	4

Are you experiencing other difficulties?

Please specify, and rate as above:

1. _____	0	1	2	3	4
2. _____	0	1	2	3	4

Read each statement carefully. Indicate how you feel about each statement by circling the appropriate number using the following scale:

1=Very strongly disagree

2=Strongly disagree

3=Mildly disagree

4=Neutral

5=Mildly agree

6=Strongly agree

7=Very strongly agree

There is a special person who is around when I am in need	1	2	3	4	5	6	7
There is a special person with whom I can share joys and sorrows	1	2	3	4	5	6	7
My family really tries to help me	1	2	3	4	5	6	7
I get the emotional support I need from my family	1	2	3	4	5	6	7
I have a special person who is a real source of comfort to me	1	2	3	4	5	6	7
My friends really try to help me	1	2	3	4	5	6	7
I can count on my friends when things go wrong	1	2	3	4	5	6	7
I can talk about problems with my family	1	2	3	4	5	6	7
I have friends with whom I can share my joys and sorrows	1	2	3	4	5	6	7
There is a special person in my life who cares about my feelings	1	2	3	4	5	6	7
My family is willing to help me make decisions	1	2	3	4	5	6	7
I can talk about my problems with my friends	1	2	3	4	5	6	7

HADS

Instructions: Read each item and place a firm tick in the box opposite the reply which comes closest to how you have been feeling in the past week. Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought out response.

I feel tense or 'wound up':

Most of the time

A lot of the time

Time to time, occasionally

Not at all

I still enjoy the things I used to enjoy: D

Definitely as much

Not quite so much

Only a little

Not at all

A I feel as if I am slowed down: D

3 Nearly all of the time

2 Very often

1 Sometimes

0 Not at all

I get a sort of frightened feeling like 'butterflies in the stomach': A

Not at all

Occasionally

Quite often

Very often

		A I have lost interest in my appearance:		D	
I get a sort of frightened feeling like something awful is about to happen:					
Very definitely and quite badly	3	Definitely	3		
Yes, but not too badly	2	I don't take as much care as I should	2		
A little, but it doesn't worry me	1	I may not take quite as much care	1		
Not at all	0	I take just as much care as ever	0		
I can laugh and see the funny side of things:		D I feel restless as if I have to be on the move:		A	
As much as I always could	0	Very much indeed	3		
Not quite so much now	1	Quite a lot	2		
Definitely not so much now	2	Not very much	1		
Not at all	3	Not at all	0		
Worrying thoughts go through my mind:		A I look forward with enjoyment to things:		D	
A great deal of the time	3	A much as I ever did	0		
A lot of the time	2	Rather less than I used to	1		
From time to time but not too often	1	Definitely less than I used to	3		
Only occasionally	0	Hardly at all	2		
I feel cheerful:		D I get sudden feelings of panic:		A	
Not at all	3	Very often indeed	3		
Not often	2	Quite often	2		
Sometimes	1	Not very often	1		
Most of the time	0	Not at all	0		
I can sit at ease and feel relaxed:		A I can enjoy a good book or radio or TV programme:		D	
Definitely	0	Often	0		
Usually	1	Sometimes	1		
Not often	2	Not often	2		
Not at all	3	Very seldom			

COPE Measure

I am interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by blackening one number on your answer sheet for each, using the response choices listed below. Please try to respond to each item separately from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you possibly can. Please answer every item. There are no 'right' or 'wrong' answers, so choose the most accurate answer for YOU- not what you think 'most people' would say or do.

Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don't do this at all

2 = I usually do this a little bit

3 = I usually do this a medium amount

4 = I usually do this a lot

1	I try to grow as a person as a result of the experience	①	②	③	④
2	I turn to work or other substitute activities to take my mind off things	①	②	③	④
3	I get upset and let my emotions out	①	②	③	④
4	I try to get advice from someone about what to do	①	②	③	④
5	I concentrate my efforts on doing something about it	①	②	③	④
6	I say to myself 'this isn't real'	①	②	③	④
7	I put my trust in God	①	②	③	④
8	I laugh about the situation	①	②	③	④
9	I admit to myself that I can't deal with it, and quit trying	①	②	③	④
10	I restrain myself from doing anything too quickly	①	②	③	④
11	I discuss my feelings with someone	①	②	③	④
12	I use alcohol or drugs to make myself feel better	①	②	③	④
13	I get used to the idea that it happened	①	②	③	④
14	I talk to someone to find out more about the situation	①	②	③	④
15	I keep myself from getting distracted by other thoughts and activities	①	②	③	④
16	I daydream about things other than this	①	②	③	④
17	I get upset, and am really aware of it	①	②	③	④
18	I seek God's help	①	②	③	④
19	I make a plan of action	①	②	③	④
20	I make jokes about it	①	②	③	④
21	I accept that this has happened and that it can't be changed	①	②	③	④
22	I hold off doing anything about it until the situation permits	①	②	③	④
23	I try to get emotional support from friends or relatives	①	②	③	④
24	I just give up trying to reach my goal	①	②	③	④
25	I take additional action to try to get rid of the problem	①	②	③	④
26	I try to lose myself for a while by drinking alcohol or taking drugs	①	②	③	④
27	I refuse to believe that it has happened	①	②	③	④

28	I let my feelings out	①	②	③	④
29	I try to see it in a different light, to make it seem more positive	①	②	③	④
30	I talk to someone who could do something concrete about the problem	①	②	③	④
31	I sleep more than usual	①	②	③	④
32	I try to come up with a strategy about what to do	①	②	③	④
33	I focus on dealing with the problem and if necessary let other things slide a little	①	②	③	④
34	I get sympathy and understanding from someone	①	②	③	④
35	I drink alcohol or take drugs, in order to think about it less	①	②	③	④
36	I joke around about it	①	②	③	④
37	I give up the attempt to get what I want	①	②	③	④
38	I look for something good in what is happening	①	②	③	④
39	I think about how I might best handle the problem	①	②	③	④
40	I pretend that it hasn't really happened	①	②	③	④
41	I make sure not to make matters worse by acting too soon	①	②	③	④
42	I try hard to prevent other things from interfering with my efforts at dealing with this	①	②	③	④
43	I go to the movies or watch TV, to think about it less	①	②	③	④
44	I accept the reality of the fact that it happened	①	②	③	④
45	I ask people who have had similar experiences what they did	①	②	③	④
46	I feel a lot of emotional distress and I find myself expressing those feelings a lot	①	②	③	④
47	I take direct action to get around the problem	①	②	③	④
48	I try to find comfort in my religion	①	②	③	④
49	I force myself to wait for the right time to do something	①	②	③	④
50	I make fun of the situation	①	②	③	④
51	I reduce the amount of effort I'm putting into solving the problem	①	②	③	④
52	I talk to someone about how I feel	①	②	③	④
53	I use alcohol or drugs to help me get through it	①	②	③	④
54	I learn to live with it	①	②	③	④
55	I put aside other activities in order to concentrate on this	①	②	③	④
56	I think hard about what steps to take	①	②	③	④
57	I act as though it hasn't even happened	①	②	③	④
58	I do what has to be done, one step at a time	①	②	③	④
59	I learn something from the experience	①	②	③	④
60	I pray more than usual	①	②	③	④

END of QUESTIONNAIRE.

Please return in the envelope provided. Thank You for your time and effort.